Volume IX

The Jewelers Circular



D. E. Hotchkiss, Publisher.

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FEBRUARY, 1878.

GEWERBE-SCHULE
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THE JEWELERS CIRCULAR.



D. E. HOPKINSON, PUBLISHER.
42 NASSAU STREET, NEW YORK.

American Clock Co.

581 BROADWAY, NEW YORK.

No. 172 State Street, Chicago. No. 7 Montgomery St., San Francisco.

SOLE AGENTS IN AMERICA FOR

E. N. Welch M'f'g Co. **New Haven Clock Co.** **Seth Thomas Clock Co.**
Welch, Spring & Co. **Seth Thomas' Sons & Co.**
A. S. Hotchkiss' Tower Clocks, made by the Seth Thomas Clock Co.

☞ ILLUSTRATED CATALOGUES FURNISHED THE TRADE UPON APPLICATION.

TWO NEW SETH THOMAS

Visible Pendulum Clocks.

A New Welch, Spring & Co. Visible Pendulum Clock.



New Orleans, V. P.
Hight, 16 inches.



Nashville, V. P.
Hight, 16 inches.

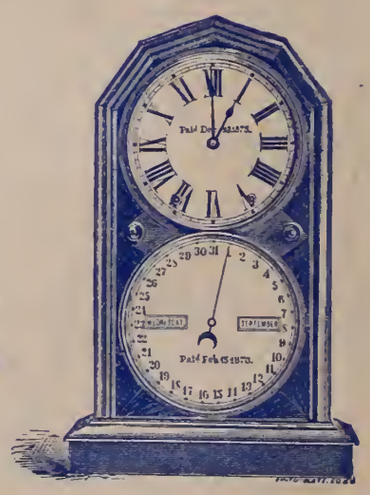


8 Day Lucca.

Two New Seth Thomas Parlor Calendars.



No. 4, Parlor Calender.
Hight, 24 inches.
8 Day, Striking, Polished, B. W. Case



No. 5, Parlor Calendar.
Hight, 20 inches.
8 Day, Striking, Polished B. W. Case.

AMERICAN CLOCK CO., Wholesale Agents for the Manufacturers.

THE

Jewelers' Circular and Horological Review.

VOLUME IX. NEW YORK, FEBRUARY, 1878. No. 1.

THE

Jewelers' Circular & Horological Review.

THE RECOGNIZED ORGAN OF THE TRADE.

A Monthly Journal devoted to the interests of Watchmakers, Jewelers, Silversmiths, Electro-plate Manufacturers, and those engaged in the kindred branches of art industry.

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☞ *All communications should be addressed,* D. H. HOPKINSON, *No. 42 Nassau Street, New York.*

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To Our Subscribers.

IN accordance with our established custom, at the beginning of the new volume we turn over a new leaf in our subscription book, placing thereon the names of those whose subscriptions have been renewed, or that have *not* expired. Therefore all whose papers have ceased to come may know that their subscriptions have expired; and we trust they will be prompt in renewing them. In the future, as in the past, no expense or care will be spared to improve the CIRCULAR and render it attractive, beneficial, instructive and indispensable, while it is hoped that the continuance of the subscription price at $2.00 per annum (a rate far below that of any monthly publication of its size and contents) will obtain for it the widest possible circulation both at home and abroad.

Volume IX.

THE JEWELERS' CIRCULAR now enters upon the ninth volume of its publication, and we are glad to state that its circulation has increased month by month, while the value of its contents has been fully sustained. We have made it our object to deal carefully, thoughtfully and intelligently with all trade subjects, having in view the special furtherance of that business morality which is essential to enduring prosperity; and, on the other hand, we have also been at special pains to furnish first-class technical articles which should be of practical benefit to the working members of the trade. We have given recent and reliable information from England and France, and have chronicled every incident of interest which has transpired at home. We have given treatises on practical watchmaking, on engraving and on enamels, besides numberless detached articles, which have been read with profit by all interested in the goldsmiths' art.

Our friends have proven their appreciation as substantially as we could desire, and we intend that the future shall, by our renewed efforts, show THE JEWELERS' CIRCULAR even more worthy of support than it has been in the past. Improvement and progress shall ever be our aim, and while we are so well seconded by the trade, as they have been heretofore, our efforts will be encouraged and their success ensured.

Prospects of Business.

THE material and commercial interests of the United States are on the highway to recovery. Extensive as the failures have been since the panic of 1873, yet making due allowance for the increase of population and commerce, they have been in no greater ratio than during the years affected by the panic of 1857.

In the four years including and following the panic of 1857 the annual amount of failures averaged $132,900,000, which, divided by the census population of 31,400,000 in 1860, would represent about $4.20 per head. In the last five years, including the panic year, the failures averaged $198,300,000 per annum, which would represent about $4.30 per head on 45,000,000, the generally admitted estimate of the present population of the country.

The feeling of depression which has accompanied the failures of the last five years, and the cry of hard times, have been seized upon and greatly magnified by the debtor class throughout the country, animated apparently by a desire to get an advantage over those who have trusted them. Western real estate speculations, like those in our Eastern cities, have ruined all those operating on borrowed capital. Chicago, after the fire, was largely rebuilt by Eastern money borrowed on mortgage. During the last two years much Western property has found its way into the hands of mortgagees through the medium of foreclosure sales. The same process has been going on here and in other large cities throughout the more populous States of the Union. The salutary effect of these sales, when taken in connection with the weeding out of weak firms by failures, bankruptcies and assignments, is very great indeed.

Through these inexorable means, and at the cost of much individual suffering, all real and substantial values have been placed on something like a hardpan basis, and thousands of active business men are thus freed from a load of debt. Were it not for the silver agitation, millions of capital would flow into industrial, commercial, manufacturing and building enterprises with the former irresistible force, and soon give abundant employment at remunerative prices to our laboring men and artisans.

Many reasons could be adduced to show that the slow but steady improvement in business affairs which we have of late from time to time recorded in these columns, is likely to continue and increase till the recovery is complete and permanent, and that, too, in spite of threatened Congressional action, which hangs like a pall over the financial future of the country. The wave of commercial depression has been rolling steadily toward the Pacific, where it is beginning to waste its force, and may be expected soon to disappear. In the Mississippi valley the roads are once more in good condition, and the farmers are rushing forward their produce. Increased activity in trade is reported from St. Louis, Chicago, Milwaukee, St. Paul, Kansas City, and other Western centres. As the farmers sell their grain they pay up last fall's bills and make new purchases. The eastward movement of flour and grain from Western lake and river towns was unprecedentedly large during the month of January, and promises to continue at an increased rate during the rest of the season. The clear cold weather we are now having has also wonderfully brightened up things at the West, and a good spring business is anticipated.

The improvement in affairs in the Southern States during the past twelve months has been more marked than in any other part of the

country, as is evidenced by the steady decrease in the amount of failures during the last three years—from $26,000,000 in 1875 to $17,300,000 in 1877. These figures speak well for Southern merchants, and cannot but greatly strengthen their credit. It is believed that the Southern and Southwestern trade of the present year will be largely in excess of that of 1877.

The greenback inflation caused a general rise in prices and in nominal incomes, under which people imagined they were becoming rich. This delusion led to an increase of expenditures and to reckless speculation. Credit became unduly expanded, and thousands bought other people's property without being able to pay for it. In September, 1873, the bubble broke. Since then we have had a continuous, and, for the most part, forced readjustment of the unnatural relations existing between debtors and creditors. The agricultural, manufacturing, commercial, and, but for the incubus of Congressional legislation, we might add the financial interests of the country are once again in a sound, healthy condition.

How They "Go into Bankruptcy."

THE most alarming feature of the bankruptcy record is the disposition of small retail firms, with from $5,000 to $20,000 of liabilities, to avail themselves of the deficiencies of the Bankrupt Act to wipe out their indebtedness and start anew. The large houses, says a Pittsburg correspondent of the St. Louis *Globe-Democrat*, are watched closely nowadays, and if they try anything of that sort the creditors are apt to make unpleasant investigations; but a shoal of the small fry have come to the conclusion since the first of the year that the easiest way to settle up last year's business is to pay all their debts with the Bankrupt Act, and start anew with a clean balance sheet. A rather interesting instance of this sort is told in one of the wholesale houses in St. Louis. A small retail dealer was in the establishment two months ago buying a bill of goods, and a discussion arose as to prices. The retailer offered a figure which he said he was willing to pay, saying at the same time that he could get the same goods for less money.

"How's that?" asked the jobber.

"Why, I can go over to A——& Co.'s, give them what they ask, go into bankruptcy before my note becomes due, and settle at thirty cents on the dollar."

Whether convinced by this reasoning or not, the wholesale dealer sold the goods at the retailer's price.

To-day he said: "You can judge how like a fool I felt last week, when just two days before the note was due my sharp customer filed his petition in bankruptcy. The amount isn't worth fighting about, and I shall have to take whatever he offers to settle at."

As long as the Bankruptcy Act holds out inducements to unscrupulous traders to pay their debts, as they say in Captain Marryatt's novels, "with a flowing sheet," this sort of thing will be kept up.

The Uncertainties of Law.

IN our last issue we gave a statement of the case of Messrs. M. W. Galt Bros. & Co., of Washington, in which it was decided by the Supreme Court of the District of Columbia, that a common carrier could not be relieved of liability for gross negligence in the carriage of jewelers' goods. This decision is all very well for people doing business in that locality, but it is well that our readers should know that the highest court of this State has qualified this doctrine in the action brought by Messrs. Magnin, Guédin & Co., of this city, against the Adams Express Company.

Few, if any, actions have been more thoroughly contested than this one. It was commenced on the 16th of November, 1863, to recover the value of a package of watches consigned to Memphis, and which was lost in transit. It was proven on the trial that the value at the place of delivery would have been from $2,300 to $2,500. No statement of value was made at the time of shipment, and no extra rate, in the nature of insurance, was paid by the shippers. The first trial resulted in a verdict for the plaintiffs, which was reversed by the General Term of the Superior Court, which decision was in turn affirmed by the Court of Appeals, and a new trial ordered. In a second trial at Circuit, judgment was rendered by direction of the Court, for the defendant, which judgment was affirmed by the General Term, but reversed by the Court of Appeals, and another new trial ordered. This time the plaintiffs recovered a verdict, which was affirmed by the General Term, but again reversed by the Court of Appeals, and a new trial was again ordered. Once more a verdict was rendered for the plaintiffs, which was reversed by the General Term, and, finally, a verdict was rendered for the defendant on the fourth trial, which was affirmed by the General Term and by the Court of Appeals.

If a superabundance of litigation should settle anything, the law on this point should be pretty well established by this case. The principle laid down by the Court of Appeals on the final trial will be interesting to the trade. It was held that where a carrier, by his contract, limits his liability to a specified amount, silence on the part of the shipper as to the real value is a sufficient fraud in law to discharge the carrier from liability for ordinary negligence, in case of loss, where the goods are of greater value than the amount specified. It was questioned, however, as to whether, under such circumstances, the carrier would be relieved where his acts amount to a misfeasance or abandonment of his character as a carrier—in other words, if he is guilty of gross negligence. In such cases, the Court refrained from expressing an opinion, and hence the final decision of Messrs. M. W. Galt Bros. & Co.'s case will be looked for with great interest. This much, however, is clearly established by the law of this State, that where goods are delivered to a carrier, without a declaration by the shipper of the value thereof, he cannot recover beyond the limited liability of the company in cases of ordinary negligence. We think it probable that another rule will obtain in cases of gross negligence, as will be shown in the case now being litigated in the District of Columbia.

The Swiss Consul's Report.

MR. JOHN HITZ, the Swiss Consul-General at Washington, has been investigating the market in this country for Swiss watches, as compared with that for those of domestic manufacture. While recognizing the fact that the country which he represents no longer finds the same market here which it did a few years ago, he finds a reason for the present state of affairs in the business tact of American manufacturers, rather than in any actual superiority of American watches. He notices that Americans do not hesitate in making present sacrifices to secure future benefits. Thus they are willing to sell at a small profit when they handle large quantities of goods, and are infinitely liberal in their advertisements.

"The Swiss should establish agencies in all important commercial towns, and should only entrust the sale of their goods to one agent in each place. Manufacturers should form a syndicate, which should decide upon rules and a system to be followed, and, like the Americans, should not shrink from any immediate sacrifice to attain the end desired. Finally, the State should aid the national industry by instituting reforms, such, for example, as reducing the tariff rates on all imports necessary to watchmaking, lowering taxes on the business and the capital employed in it by encouraging the formation of joint stock companies; by fostering the establishment of technical schools, and, above all, by passing a patent law, which should strengthen and protect industry; it should also, by the establishment of a strict supervision, prevent the exportation of all inferior merchandise."

These suggestions do not commend themselves to our judgment. It does not appear practicable, in these days of trade competition, that all Swiss makers should consent to be represented by one central agent; nor should the State become such a factor in any trade as suggested by Mr. Hitz, a course of action which seems to us exceedingly unwise and improper. We thoroughly agree with Mr.

Hitz in regard to the necessity of the increased business energy which he advises; Americans have learned that by spending fifty cents in advertising they can make a dollar, and net fifty cents which otherwise they would never have seen. There are many good points made by Mr. Hitz with regard to the social economy of this country, in which he states that French workmen mind their business strictly, instead of running around after feasts and festivals. He also notices the fact that American machinery does all coarse work, thus enabling the capitalist to set fine workmen at fine work, and he refers to the division of labor by which one man pushes the market and finds out what is wanted, and another supplies it. Foremen are well paid in this country, and are able to turn out a large amount of good work, because the different parts of the watch are so exactly made that putting them together is a comparatively easy matter, requiring labor of only ordinary excellence. This is especially the case where the Waltham machinery is used, which has won a world-wide reputation for wonderful accuracy and precision. In referring to Mr. Hitz's report, we wish to say that, for the present at least, the Swiss remain supreme in the field of fine and complicated watches, but there can be little question, on the reasoning of Mons. Favre Peret, Mr. Hitz and the multitude of commentators and critics on their statements, that in other grades the American market is supplied, and properly, by watches of domestic manufacture. It may be the Swiss will regain their supremacy in this field, but it will be only by the introduction of American machinery and American management into the country which has for centuries been the stronghold of the watchmaking industry of the world.

The Jewelers' League.

THE members of the Jewelers' League held their first annual meeting for the election of officers January 15th, 1878, at No. 164 Broadway. A large representation was present, who manifested great interest in the progress of this admirable institution. The meeting was called to order and the minutes of the proceedings of June 8, 1877, read and approved. After which Mr. Thomas Slater, President of the organization, in an appropriate address congratulated the League on the success it had accomplished during its brief existence, and paid a high tribute to the Executive Committee, which had labored incessantly and indefatigably to promote the welfare and progress of the society. Mr. Slater stated that the dull times had prevented a great many from joining, and the vexatious delay in getting the charter was also a serious obstacle, but happily the latter had been overcome, and *times* were improving. He urged the committee and the members of the League to exert themselves in furthering the interests of the association, and predicted a prosperous future for it.

The Secretary then read a very gratifying report, which was adopted and spread in full upon the minutes. Mr. Woglom read an interesting report of the work of the Executive Committee, which was also adopted. A communication was received from Mr. George C. White, tendering his resignation as the third Vice-President, which was reluctantly accepted. After some routine business had been passed upon, the election of officers took place, and resulted as follows: For President, Thomas Slater, of Messrs. Enos Richardson & Co.; 1st Vice-President, C. C. Adams, of the Adams & Shaw Co.; 2d Vice-President, David Dodd, of Messrs. Chatterton & Dodd; 3d Vice-President, A. K. Sloan, of Messrs. Carter, Howkins & Sloan, in place of Mr. George C. White, resigned; 4th Vice-President, Sam'l W. Saxton, of Messrs. Saxton, Smith & Co.; Secretary and Treasurer, Mr. J. D. Yerrington, of the Morse Diamond Cutting Company.

The above named gentlemen were unanimously elected to their respective offices, after which the election of the Executive Committee took place, and resulted as follows: Robert A. Johnson, of Messrs. Colby & Johnson; George R. Collis, with Messrs. Tiffany & Co., and Henry J. King, with Messrs. H. F. Barrows & Co., to serve one year; and G. T. Woglom, of Messrs. Woglom & Miller; Wm. C. Kimball, with Messrs. H. F. Barrows & Co., and James P. Snow, of Messrs. G. & S. Owen & Co., to serve for two years.

Mr. Woglom then complimented Mr. King in a neat and humorous address for his able and efficient services as acting Secretary of the League, and Mr. King replied, courteously acknowledging the compliment paid him, after which the meeting adjourned.

A Deserved Tribute,

SOME forty-five of our leading jewelers and wholesale dealers in watches, etc., have presented Inspector William Murray with a very handsome gold watch and chain and an engraved testimonial, in recognition of his services as a police officer in charge of the district in which they do business. On Friday, the 25th ult., Messrs. William R. Alling, of the firm of Alling Bros. & Co., and Henry Hayes, of the firm of Wheeler, Parsons & Hayes, called on the Police Commissioners and presented the following communication:

NEW YORK, *January* 25, 1878.

TO THE BOARD OF POLICE;

Gentlemen:—The manufacturing jewelers and wholesale dealers in watches and jewelry, of the City of New York, appreciating the service and fidelity of Inspector William Murray, desire to present to him a gold watch and chain and the accompanying testimonial, and have designated the undersigned as their committee to make such presentation, and to request your permission for the Inspector to receive the same. Very respectfully,

W. R. ALLING, }
HENRY HAYES, } *Committee.*

Messrs. Alling and Hayes took with them an artistically engraved testimonial, from the pen of D. T. Ames, cased in an ornate frame 3½x3 feet, and a gold watch and chain, expressly designed for the occasion. The testimonial is as follows:

"The manufacturers of jewelry and wholesale dealers in watches and jewelry, in the City of New York, desiring to recognize, as a trade, the valuable and skillful services rendered to them and to the whole community by Inspector of Police William Murray, in the discovery and capture of criminals, and especially the robber of Alling Brothers & Co., the undersigned, manufacturers of and wholesale dealers in watches and jewelry, cordially and earnestly unite in tendering to Inspector Murray this testimonial of their esteem and of their high appreciation of the fidelity, energy and skill which he has at all times displayed in the efficient discharge of his difficult and perplexing duties.

Durand & Co., Miller Bros., Wheeler, Parsons and Hayes, Shafer & Douglas, Hodenpyl, Tunison & Co., Randel, Baremore & Co., Buckenham, Cole & Hall, Enos Richardson & Co., Chatterton & Dodd, Carrow, Crothers & Co., Smith, Hedges & Co., Baldwin, Sexton & Peterson, Carter, Howkins & Sloan, Whiting Manufacturing Co., Seth W. Hale, Taylor Bros., John A. Riley & Co., Spadone & Abel, William Riker, G. W. Pratt & Co., J. T. Scott & Co., J. B. Mathewson & Co., Freund, Goldsmith & Co., J. E. Spencer & Co., S. W. Chamberlain, Hirsh Brothers, Sillcocks & Cooley, L. & M. Kahn, Oppenheimer Bros. & Veith, Keller & Untermeyer, Durfey & Shiebler, W. H. Ball, E. Bissinger & Co., Spiess & Rosswog, Field & Co., Maas, Cook & Groeschel, D. M. Fitch & Co., T. W. Adams & Co., Geo. W. Street & Son, D. Bruhl, A. Wallach & Co., Thos. G. Brown, Colby & Johnson, Churchill, Lewis & Co., Alling Brothers & Co."

On the inside of the watch case is the following inscription:

"Presented to Inspector William Murray by manufacturers and dealers in watches and jewelry, in the City of New York, as a testimonial of his integrity, zeal and efficiency. January, 1878."

The watch is a hunting case, stem-winding Howard & Co. movement, and cased by Messrs. Wheeler, Parsons & Hayes. On the outside of the case is the monogram, "W. M.," designed in policemen's clubs and belts. The chain is singularly appropriate, consisting of a length of gold cable, then a pair of fetters in platinum, and another length of cable to the bar wheel, which represents a policeman's baton, from the ring of which is suspended a dark lantern of exquisite workmanship. Inspector Murray has reason to be proud of this handsome and substantial testimonial, which proves, in a highly gratifying manner, the respect in which he is held, and the ability with which he has discharged his duties in protecting a part of the city which presents peculiar temptations to the criminal classes.

The Exhibit of Goldsmiths' Work at the Loan Exhibition.

THE Loan Exhibition came to a close on Saturday night, the 12th of January, after having been open, day and evening, for six weeks. It was visited by numerous persons belonging to all classes of society, for the entrance fee had judiciously been placed at twenty-five cents. The net proceeds, which were paid over to the Society of Decorative Art, amounted to nearly eight thousand dollars.

Before this splendid collection of articles of *vertu* becomes entirely a thing of the past, it will be interesting to say a few words about the exhibit of goldsmiths' work, which had been carefully arranged in a manner which allowed the student to compare the productions of the different periods of ornament in different countries—from the oldest times up to the most recent productions of American manufacture. No. 1 of the catalogue consisted of twenty-four pieces of gold jewelry, found on mummies in Egypt. These specimens, which consisted principally of earrings and rings, were very similar to pieces found in Italy and shown in the Castellani collection, and to those dug up at Cyprus by General di Cesnola. In some of the the earrings were, threaded like beads, irregular pieces of stone of different kinds, turquoise and amethyst being the most frequently used, which confirm the idea that the ancients were no great hands at stone cutting, although next to them we find some *scarabei* cut in hard stones and in some of which are incrusted transversal lines of gold and other metals. The beetle, whose scientific name is "*scarabeus*," was held in high veneration by the Egyptians, who gloried in this insect, generally despised by other nations, is the emblem of the productive divinity which keeps the world alive; for this insect hides its eggs in a ball of dung and then drags it with its hind legs to a warm sand bank where it buries it before its death. When the eggs are hatched by the heat of the sand the small larvæ find sufficient nourishment in the manure with which their provident parent has surrounded them, and are thus enabled to live until they themselves become perfect insects, reproduce themselves as their parents did, and, after preparing their eggs, die, having fulfilled their mission in the world. This is why the *scarabeus* is represented on Egyptian monuments as holding in its paws a ball.

A fine set of jewelry, comprising a heavy necklace, a pair of bracelets and earrings, the property of Mrs. J. Pierpont Morgan, made of *scarabei*, set in heavy gold ornaments, struck up in dies and connected with link chains, was an interesting specimen of modern Egyptain work. The settings for the stones, which are ancient, were made in Cairo, from antique designs furnished by one of the most expert collectors of Egypt. Next came some modern Egyptian bangles in silver, heavy and roughly made, suggesting the idea that they had been hacked out in the roughest way possible, yet they were not without a certain quaintness, which has its merits; a triangular pendant armlet, from Jeruselum, with a head-piece, presented a curious design—the triangle, covered with a singular derign in filigree, was hung by the apex, while from the base hung a row of bright silver balls. Some modern Syrian gold work showed very skillful workmanship in light filligree with square instead of the round wire used in work of this kind. Old Russian girdle clasps, in silver, ornamented with the peculiar Russian *niello* known as "*Toula*" from the name of the factory where it was usually made, opened the line of that peculiar heavy silver work jewelry which is so much prized in the frozen regions of Northern Europe. Norwegian silver link buttons, one of which was shaped like a ball and the other long and narrow, which are next to the Russian work, recall very much the present style of link sleeve buttons, only that they are larger and heavier. A Norwegian clasp for a wedding girdle, made of heavy gold, has attached to it as pendant ornaments, on one-half of it, the initials of the bride, and on the other half those of the groom. When the belt is clasped these letters are brought together. Reproductions of old Swedish, Norwegian and Danish jewelry, by Christesen Mechelsen and other jewelers of that part of the world show that the goldsmiths of Copenhagen and Christiana are not far behind those of Paris and New York. The old German jewelry, including a gold pendant in the shape of a crucifix, made at Cologne in the sixteenth century, and loaned by Mrs. Sidney Webster, some chatelaines of the eighteenth century, and an exquisite necklace of Nurenberg work of the seventeenth century, the property of Mr. Frederic R. Jones, was well represented by several other well selected specimens. Next in order came the Italian work, more delicate in ornament and work than that of Germany and Norway, and including some good examples of the peculiar jewelry with which the peasants love to adorn themselves—among them were silver-gilt and gold earrings from Tuscany, a gold chain from Lombardy, Florentine work in gold and seed pearls, peasant earings from Romagna, and a gold ornament from Tschia—these two last belong to Mrs. Frederic Stevens. Specimens of French peasant jewelry were also shown among others, some of those pendants in the shape of a cross hung to a piece of black velvet, the slide on it being shaped like a dove, forming what is termed a "*Saint-Esprit*," and made of imitation stones set in silver and often in brass or copper. One of the finest specimens of this old Normand jewelry belonged to Mrs. August Belmont—an old Normandy cap pin, singular in design, belonging to Mrs. G. F. Jones, was a piece of great interest. Modern work was represented by specimens from the shops of Castellani, and Pierret of Rome, Bigatti of Florence, Callingwood of London, Samper & Froment-Merric of Paris, and Tiffany of New York. In another case were some interesting specimens of different kinds forming a choice lot of "Bric-a-brac" jewels. Among these were some old diamond link earrings and quaint old rings. A ring formed of several thin rings hinged together and which opened out formed a bracelet, the "*chaton*" of the ring being used as a clasp. Some Pompeian and Norwegian gold rings which would make nice scarf-slides and things too numerous to mention. Indian, Chinese, Japanese, Turkish and Maltese jewelry were also well represented.

Let us hope that the success which has attended this exhibition, will lead to a repetition of the effort at some future period, when more time and a more thorough organization can be given to the enterprise, and let us also beg to suggest that it may be opened at a time of the year when the workman and salesman, who perhaps, would profit more than any one by the instruction they might derive from the inspection of the specimens, would have leisure time enough to study the collection thoroughly.

OUR readers will regret to learn that the serious illness of our valued contributor "Expert" prevents him from forwarding his wonted article in time for this issue. We trust, however, that his indisposition will prove of short duration, for the trade can ill afford to loose his able and interesting essays on engraving.

REFERENCE to the advertisements of the Waltham and Springfield, Illinois, Watch Companies will show that these two prosperous concerns have announced with decision and promptitude that they decline to sell their goods to dealers outside the regular channels of trade. This is as it should be, and merits the hearty recognition of all retailers, whose business is being frittered away by the encroachments of so-called religious newspapers.

FOR once, a fraudulent bankrupt has received his due, and, thanks to the persistent prosecution of Schulman & Edelstein by Messrs. H. B. Claflin & Co., these worthy gentlemen, who offered their creditors eighteen cents on the dollar, will serve out the rest of their liabilities in the State Prison. This is a good example of those cases where mercy should give way to justice. The case was clear, and the law was enforced. That there are many cases of similar character, that are skimmed through by the fraudulent insolvent, leaving him in condition to start again with ready money, there can be no doubt. Messrs. Claflin & Co. have set us a good example, which we hope will be followed whenever any such cases come before the trade.

Manufacture of Jewelry.

BY GEORGE WALLIS.

THE next distinct style of manufacture, passing over the Byzantine period as one of transition, is that known as the Merovingian of the fifth century, and the Anglo-Saxon of later date. With them may be associated the Celtic, all finally leading to the mediæval jewelry popularly known as the Gothic. We have orientalism running through all these, of a character more or less marked, but ever modified by the peculiar spirit of each age, yet ever preserving the traditions of the goldsmiths' art in the application of details, and the adaptation of forms to use.

The Merovingian and Anglo-Saxon character of construction and decoration is best illustrated by ornaments, in which thin slabs of garnet are set upon films of diapered gold. The slabs are divided, and held in position by thin walls of gold, soldered vertically, as in cloisonné enamel, some of the Anglo-Saxon examples being decorated with elaborate filigree work, executed with marvellous accuracy and skill as regards detail. The beaded work, and cords of twisted gold, brought into play by means of the intricate convolutions of their details, is ever a subject of interest to the antiquary and the intelligent jeweler; not only from the *finesse* which characterizes the execution of the work, but for the exquisite and appropriate character of the design, which never seems to fail or exhaust itself.

The Celtic hammered work in plates of gold, of various sizes, forms, and adaptations to uses now unknown, are evidences of another kind of skill. The ornamental details are in repoussé;—vitreous pastes, amber, and rock crystal having a perfectly smooth rounded surface, or, speaking technically, cut "*en cabochon*," are also used as decorative adjuncts. Filigree and plaited work, and delicately overlaid wire ornaments, also characterized much of the Celtic jewelery, together with niello and enamel. The skill in execution and wonderful subtility of design found in some of these ornaments discovered in Ireland and Scotland cannot be excelled; but the Oriental spirit manifested in some of the specimens is unmistakable.

Mediæval jewelery of the period from the tenth to the thirteenth century, is rarely seen except in the form of rings. These are either of great simplicity or massiveness, and frequently of both. They show little tendency to elaboration in the way of ornamental details, or any departure from the essential form necessary to the object in relation to its use.

The sixteenth century, known as the period of the *cinque-cento*, brought as great a change in jewelry, and objects of personal decoration, as in any other division of the arts. Gothic art had expended itself, but had stamped its spirit on everything of use and decoration, whether civil, military, or ecclesiastical. It had become fossilized, as it were, dead, and utterly contrary to the new condition of things which spring up with the revival of learning in Europe. All its forms and traditions had to give way before the genius of the artists of the *cinque-cento*, period, men who were not handicraftsmen merely but artists in the best sense of the word, when the jewelers' art culminated in the works of Albert Durer, Benvenuto Celleni, and Hans Holbein.

The Italian goldsmiths and jewelers of the *cinque-cento* have left such examples of their ability, as will ever continue to influence in a greater or less degree all future workers in gold. The character of the design and workmanship, at once so rich in detail, yet so light and elaborate in the mass, the exquisite arrangement and introduction of the gems employed, the beauty of the enamel, whether opaque or translucent, and the perfect adaptation of the jewels to use in connection with the rich and elaborate costumes of the period of which these jewels formed no inconsiderable portion, must ever leave the *cinque-cento* in the ascendant, as regards its decorative character and the power displayed in its design and execution.

Of the seventeenth and eighteenth century works, very little need e said. The art became more or less mechanical, with the excellence of workmanship in the accurate manipulation of the metal, the elaborate cutting of the stones, the fitting of the parts together, so as to convey the idea of a finished article, but with very little regard to the special relation which the ornament was intended to bear to, or the part it was to play in, the costume of the period. Gorgeous in the abstract, the clustered diamonds were often brought together rather for the purpose of combining a given value in some settled form, than for the purpose of utilizing the beauty of the stones for the realization of an elegant and appropriate design. The problem to be solved had altogether changed. It was no longer, "Given, a design to be realized in materials best suited to render the object a work of art suitable for wear as a personal decoration," but it was "Given a certain number of precious stones of exceptional size and value, for the combination and construction of an ornament which, whether suitable for wear or not, should be of a fixed value in money." Fine art workmanship shrinks from the solution of such a problem, when mechanical power and skill in construction is opposed to sound taste in the realization of beauty and fitness of purpose.

It was not until after the Great Exhibition of 1851, that much attention was paid to the perfectly consistent and generic character of the Oriental design. The jewelry of the East had been up to that period regarded as only fit to be classed with the ornaments for personal decoration, used by semi-barbarous peoples in all quarters of the world. A careful examination, however, of the examples exhibited in 1851, and of others which subsequently found their way to Europe, showed these Eastern jewelers had really laid the foundation for much of the tradition which had existed from a very early period in the goldsmiths' and jewelers' art as exercised in the West, and that, however rude or uncouth the surface finish of stones and gold work might be, the ornaments were instinct with the true spirit of decorative design. Nor could it be said that, considering the primitive means at the disposal of the workers in gold and silver, they fell below the Western workman in true skill. With an instinctive perception of harmony of color, the primitive hue of stones, brilliantly tinted translucent enamel, filigree work, and twisted wire work, were brought to bear on jeweled constructions, in which skill of hand was only secondary to the perception of beauty that governed the production of the various objects, which Oriental tradition and custom led the jeweler to execute. It was only when under some European or other foreign influence, when the worker attempted to adapt his art to forms suited to meet Western requirements that he failed. The want of congruity between the general form as adapted to European use, and the traditionary decorative details, was fatal to success.

The traditional jewelry of Europe is best illustrated in what has been called the "Peasant Jewelry" of the various Continental nations. These vary considerably in different localities, as regards the general forms of the ornaments themselves and the character of the details, but the most ancient and genuine examples appear to be all based upon one simple mode of production, that of a thin plate of gold or silver in which the design is executed by perforations, delicate repoussé work, and the setting of stones, either real or imitation.

The custom of the ornaments of the women of one generation descending to their daughters in the next, and being handed down in families from age to age, is altogether so contrary to the modern notions of change of fashion within short periods of time, that we see at once the old and new systems are diametrically opposed to each other, and as the influence of modern change is widespread and inevitable, the preservation of specimens of the jewelry of the common people of the various countries, not only of Europe, but of the world, has been a subject which has engaged much attention since 1867, when Signor Castillani of Rome brought his famous collection of Italian peasant jewelry before the public in the Paris International Exhibition. This collection is now in the South Kensington Museum, classsified to illustrate the various provinces of Italy; and large additions have been made during the last two or three years of specimens of French chiefly from Normandy, Spain, various parts of Germany, Denmark, Holland, Switzerland, and finally, of the common decorations and trinkets worn by the people of India.

Horological Revivals.

WHILE in England, no end of sermons are preached by ministers of high, low, broad and narrow political persuasions on the text "British Interests," in Germany the Knights of Pivots are inaugurating a crusade, offensive and defensive, for the honor of their trade and their "individual interests."

With this object societies have been and are being formed in all parts of Germany. There is a central association in Berlin, with which the others, called "local Unions" are in communication. If the reports of these societies are true, there exists a kind of "horological millenniums"—the Jacobs and the Esaus are meeting and falling on one another's necks everywhere, and confessing the sins of their long estrangement through trade jealousies. But this outburst of "brotherly love" is not so much the force of "pent up affections" as from the fact, that common enemies are knocking at the door, and when hostile forces are at the gates, it is time that family feuds should cease. And thus we find that watchmakers who for years were strangers, because of their "interests," are by "interest" reconciled, and are working hand in hand, and the mutual exercise promises a more healthy constitution to the watchmaking fraternity of Germany.

The interesting subjects of discussion which have done so much, are the sale of watches and clocks by traveling vendors and at mock auctions, the retailing of goods by wholesale houses and manufacturers, and the credit and discount system.

These are topics to which watchmakers in this country are no strangers, and therefore may feel interested in knowing the course their "brethren in the Kraft" intend to pursue, and are pursuing. Are there not many villages and market towns in England where "first-class second-hand watches, fresh from places not necessary to mention, are knocked down to the innocent rustic or credulous mechanic?" What are they who organize clubs by advertisements which appeal to the ignorance of the public but "traveling cheap Jacks?"

Here there is certainly a pinch where both have corns, against which the Germans apparently intend vigorous action both voluntary and legal.

At a large meeting of delegates at Wiesbaden, in September, a petition to the German Parliament was suggested, agreed to, and is now circulated and signed everywhere, praying for the legal prohibition of selling watches by "traveling vendors and auctions." Whether such a legal process is practically beneficial, is very doubtful, but apart from its positive protectionist policy for watchmakers, it will no doubt protect the public more, because they are the immediate losers, by buying worthless articles, and the watchmakers, indirectly, because the cash that would have gone towards the purchase of a better article is turned into wasteful channels, and both become losers.

The watchmakers in Germany do not intend to wait quietly while legal protection is being cooked. Special addresses to the public against buying the fictitious goods and exposing the system are being prepared, for it appears that the manufacturing of "cheap Jack watches" of a most doubtful sort directly for the hammer is carried on rather extensively, and the public who judge by external appearance only, are thus allured by the price of an article which from its nature affords ready means for deception.

Another grievance of which they intend to relieve themselves, is the retailing of goods by "wholesale houses." It seems that some houses supply the public at the same prices as the trade. The public are always on the look out for "bargains," are no doubt ready to profit by any opportunity, and thus a competition is created that has a most demoralizing effect on the trade, for profits are a "condition of existence," and therefore inferior articles must be offered, and no doubt herein lies one of the causes of the low condition of the German watch trade.

Now, however, they have come to an agreement to buy only of those houses who will bind themselves not to sell retail. If the majority of the trade are able to do this, it will go to prove that their condition is better than they would lead us to think, because it argues a certain amount independence not always realized by watchmakers whose means have been undermined.

Whether the monopoly of dealing with the public is the right of retailers, is a question we cannot now discuss, but it is the practice in this country, and so would not be without importance; meanwhile our readers will find it interesting to hear from time to time how this battle is progressing in Germany.

The list of complaints appears not however exhausted yet, for in addition to this sharp competition, the credit system seems to have arrived at such a pitch in Germany, that those who do pay demand discount. This grievance is still under discussion, and no settled opinion has been arrived at how to deal with the difficulty.

The crisis in the downward tendencies of the German watch trade appears to be past, and a healthy reaction to have set in. Hitherto the competition was mainly in "selling cheap," now, however, the general resolve that echoes from all these meetings throughout the length and breadth of that land is "reality." The further guarantee of the realization of these resolutions lays in the contemporary propositions and movements, to bring a better disciplined army of watchmakers into the field, both theoretically and practically.

A school for watchmakers is to be opened in Glasshütte, in Saxony, next April, apprentices are to pass an examination at the expiration of their term, and are to receive certificates and diplomas according to their standard of scientific and practical attainments. Further, a movement is on foot for masters to bind themselves not to employ hands without a certificate, nor a journeyman without a written character, nor to discharge one without giving it. In these positive movements lays, no doubt, the pith of the regeneration of the German watch trade. In proportion as the trade is taken possession of by men who are not practical, and only use it as a market place, to buy and sell in, so does illegitimate competition demoralize it, while the diffusion of a "workman spirit" will give health and vigor to the trade. If these plans are carried rigorously into practice, they will rid the trade of botchers, and bring merit prominently to the front. It will stimulate the young, and supply their growing appetite with sound food; produce a trained band of workmen, from the ranks of which masters will arise who will compete as men who set quality and the honor of their trade above the mean competition of the past.—*The Jeweler and Metalworker.*

The Behavior of Steel during Hardening.

JOSEPH ROSE, a correspondent of the *Polytechnic Review*, says: "There appears every reason to believe that cast steel undergoes a structural change during the last stages of cooling in the hardening process, and that this fact has not been recognized save by operative workmen, since no mention is made of it in works upon hardening. The facts upon which this opinion is based are as follows: File hardeners take the files from the cooling water when cooled to a temperature of about 100° Fahr., and after sighting the file, to ascertain its straightness, pour cold water on the rounding side of the file, which by contraction tends to straighten it. If, however, the file has once been reduced to the temperature of the atmosphere, repeating an application of cold water on either side of the file will have no effect whatever. Some tool hardeners place beside the forge a plate pierced with holes of various sizes, and in the case of such tools as reamers, extract them from the cooling water before cooled to the temperature of the water (while hot enough to cause the water adhering to the tool when extracted, to dry rapidly off); after sighting them with the eye, to note in which direction they may be bent, they place them in a suitably sized hole in the plate mentioned, and with the hollow side of the tool uppermost, exert a pressure upon it to straighten it. These men also assert that by this means a tool bent in the cooling can be straightened, but that if the steel has once become cooled after the hardening the operation will have no effect whatever. From this it appears that during the first stages of the cooling the structural formation of the steel undergoes a change, which may be influenced by pressure, whether produced by the strain of contraction or by mechanical means, and that this structural change terminates in a permanent set. This subject is well worthy of investigation.

Practical Hints on Watch Repairing.

By Excelsior.—No. 35.

THE SPRING-DETENT OR CHRONOMETER ESCAPEMENT—CONTINUED.

(547) The Wheel and Detent Action.—In drawing this action there are four pieces which mutually determine the form and position of the parts: the wheel, both rollers, and the detent. As there are different constructions of this escapement, we will first delineate the ordinary English style of chronometer escapement. See Fig. 35.

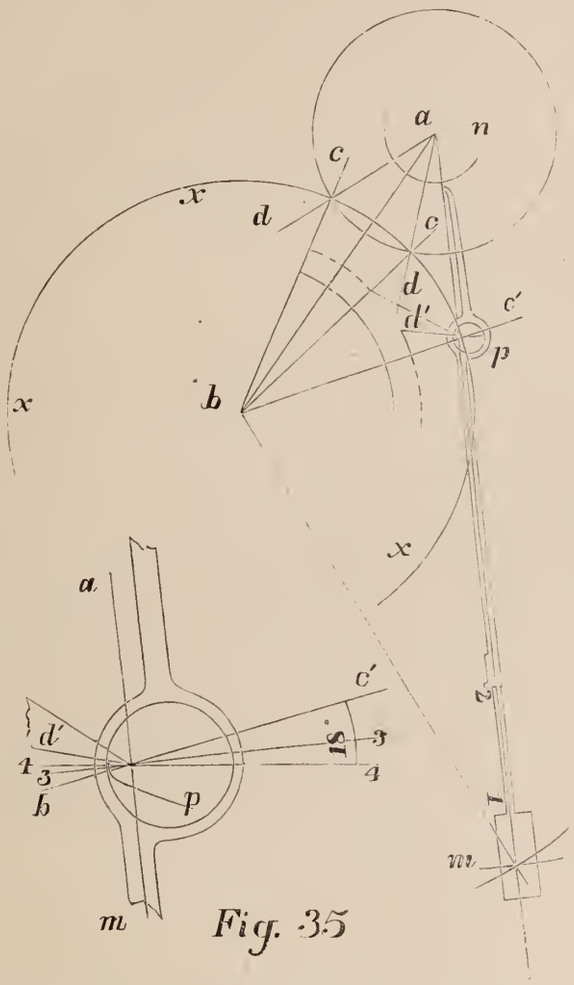


Fig. 35

If we are at liberty to make the whole, from the beginning, as we conceive that it should be, the only measurements we take from the movement are the distances between the pivot holes of the escape wheel, the detent and the balance. In the English style, where the detent spring is a part of the detent itself, which is screwed fast to the plate and therefore has no pivot hole, we substitute the screw hole in the plate. (In box chronometers, where the hole in the plate, for the detent screw, is oval instead of round, it is better to measure from the steady pin hole.) The process is to draw the wheel and the roller, as already indicated, then from their pivot holes strike two curves, whose crossing shall be the center of the detent screw (or pivot) hole.

(548) Having carefully measured the distances between the three holes, and increased each of them ten times, (or twenty, or thirty times, if preferred,) we draw the line *ab* the length of the enlarged wheel and balance center-distance, lay off the 24° lines, *bc*, *bc*, and lines *ad*, *ad*, then describe the wheel and roller circles as in Fig. 34. As the detent locks the second tooth from the roller, in the English chronometer, we lay off 24° more from the right hand line *bc*, and draw line *bc'*. Where this crosses the wheel circle, *xx*, is the proper position for the point of the second tooth from the roller when locked, and the pallet *p* must be so placed in the detent as to rest against the tooth and lock it in that position. From *a*, through the crossing of the line *bc'* and the circle *xx*, draw the straight line *am*, which gives the line of the detent. With the dividers or other tool for drawing large circles) set to the enlarged center-distance between the balance and detent holes, set one point on *a*, and with the other mark a curve across the line *am*; with them set to the enlarged wheel and detent center-distance, strike a similar curve from *b*. The crossing of these curves gives the proper relative position of the detent hole, and consequently the length of the detent from the center of that hole to the locking point on the pallet *p*.

549 We may now draw the outlines of our detent, making its shape such that the line *am* will pass through the center of the screw or pivot hole *m*, of the spring, reaching from 1 to 2, and of the detent from the spring to the pallet pipe or ring at *p*, then through the face of the detent pallet at the point where the tooth rests when locked, and finally touching the extreme point of the detent. The object of having all that part of the detent from the screw hole to the pallet in a straight line is to prevent any tendency to spring under the thrust of the tooth when locking, which might be the case if the detent was light and the pressure came upon it obliquely, or outside of the direct line of support. The portion from the pallet ring to the point is better to be a little curved near the point than straight, having but a slight surface in contact with the gold spring, (Fig. 40,) to lessen the liability of any adhesion between them, which would increase the force required for "passing" the unlocking spring. The point should come very near the tip of the unlocking pallet, (see Roller and Detent Action,) and should not be narrowed down, but left of full width, although thin, and the contact surface filed truly vertical, to support the end of the gold spring in a like position. The whole of the detent should be as light as possible consistently with proper stiffness, and the ring, with the portion of the detent near it, should be at a safe distance below the wheel teeth, so that no amount of end-shake in the wheel or accidental springing of the detent could make them touch.

(550) The locking pallet, *p*, is represented in the figure as being semi-circular; but it is often made of triangular and other shapes, an example of which is shown by the dotted line crossing the letter *p* in the small figure. This is not material, but the inclination of its acting face must be such that the pressure of the tooth upon it shall create a slight but positive "draw" upon the pallet, bringing the detent to its place. The spring portion of the detent, from 1 to 2, although thin, so as not to oppose any more resistance to the vibration of the balance when unlocking than is unavoidable, is wide, for giving the necessary stiffness to resist the push of the tooth when it drops upon the pallet, *p*. This width, and the face of the pallet, must be exactly vertical, or perpendicular to the plane of the wheel. When a semi-circular pallet is used, it is held in the ring by a short steel plug whose form is that of the other half of the circle, and both are cemented in the ring together, just filling it. If other shapes are used the plug or plugs should form, with the pallet, a cylinder fitting in the ring,—but only the pallet projects above it. By softening the cement, the whole can be turned in the ring, to give any desired inclination or "draw" to the acting face of the pallet. In altering the "draw" in an already completed movement, it should be remembered that the turning of the pallet in the ring will raise or lower the locking point. The effect of this is the same as if the pallet was too near or too far from the point *m*, viz.: the wheel is not held in the right position when locked—either too far forward or back, so that the impulse pallet is liable to strike or graze the points of the teeth as it vibrates past them. If thought best, the pallet can be shaped like the impulse pallet, Fig. 34, and cemented in a slot in the same way. But the ring plan is most in favor.

551 There is a banking pin or set screw planted in the plate, or in a stud called the banking stud (not shown for regulating the intersection of the locking pallet into the wheel circle. The point of the tooth when locked should not lap upon the jewel more than one-fourth the breadth of its acting face, and less would be better if the

wheel is perfectly concentric and true, the faces and points of the teeth all perfect, as well as the corner of the pallet, and the unlocking action correct. If the teeth are bent, or their front faces or points are bruised or worn where they rest on the locking pallet, the teeth embracing the roller will some of them be too near and will catch on the impulse pallet. They are also liable to fail to lock properly or to slip off the locking pallet, when the wheel and the roller will collide as described in (543). A perfect escape wheel is a *sine qua non.*

(552) The detent spring is supposed to be stiff enough to bring the detent promptly against the set screw, on its being released from the unlocking mechanism, but the draw of the pallet makes a safe intersection of the tooth and pallet more certain, without increasing the strength of the spring; since, if they touch at all, the draw will aid in bringing them to the proper depthing. This draw must not be too great, as it would seriously retard the motion of the balance while performing the unlocking. To make this point more clear, an enlarged sketch of the pallet, the ring, and the escape wheel tooth, *d'*, resting on the pallet, is given in the small figure at the bottom of Fig. 35. The dotted line, *am*, of the detent, passes through the acting face of the pallet at the point of rest of the tooth; and *bc'* is a part of the line from the center of the escape wheel through the point of the locked tooth. The line 3, 3, is at right angles to the line of the detent, *am;* therefore, if the face of the pallet was in that line, there could be no "draw" when the tooth rested on it, although otherwise it would form a good angle with the face of the tooth. Only the point of the tooth must touch the pallet. Giving a few degrees more of inclination, as by the line 4, 4, which forms an angle of about 18° with the line *bc'*, we have the inclination usually given to the locking pallet in the English chronometer, as causing enough draw for safety, without being more than necessary.

(553) If the draw is too great, it retards the motion of the balance in unlocking not only by the greater friction of the tooth added to the stiffness of the detent spring, but also by the recoil of the wheel. When the detent pallet is moved back to unlock the tooth, it must carry the wheel back a certain distance against the pressure of the mainspring as the tooth passes up the inclined plane from the point of rest to the edge of the pallet, where it escapes. The greater the draw or inclination of the acting face of the pallet, the greater is the recoil and the consequent loss of momentum by the balance. If the tooth at the right of the roller happens to stand pretty close to it, this recoil of the wheel may carry the tooth back against the roller edge, or so close as to interfere with the regular running, at every forward vibration of the balance. The remedy, of course, is to alter the pallet in the ring, and reduce the draw. This both diminishes the recoil or back motion of the wheel, and lets the tooth stand further from the roller edge when locked.

554. There should always be draw enough, however, to act positively and promptly when the tooth drops upon the pallet. Suppose the pallet face to be in the line 3, 3, Fig. 35, so that there would be no draw. Then if the tooth should reach the detent before the latter had got quite to its place against the set screw, it would remain where it happened to strike the pallet, possibly at the very edge—making the locking unsafe, and increasing the danger of the detent being jarred out from before the tooth by external disturbances, in which case tripping would occur, as in (543). In case the detent spring was stiff enough to force the detent to its place under the pressure of the tooth, it would certainly be too stiff to permit a free motion of the balance and good results in timing. Pallets are often found so placed that they not only have no draw at all, but have their faces inclined in the opposite direction, or sloping towards the front edge. When the tooth drops upon such a pallet, its tendency is to slip off, by forcing it back instead of drawing it in. An improper inclination of the locking face is a frequent cause of tripping.

555. A gauge for testing the inclination of the locking pallet can be easily made from a thin slip of steel, with its left edge filed perfectly straight, and long enough to reach from either of the notches shown to the screw (or pivot) hole of the longest detent used. In Fig. 36, the notch, 1, is for an English detent pallet,—the others are for Swiss pallets, as will shortly be explained. The straight side of the notch, 1, forms an angle of 6° from the perpendicular to the straight edge

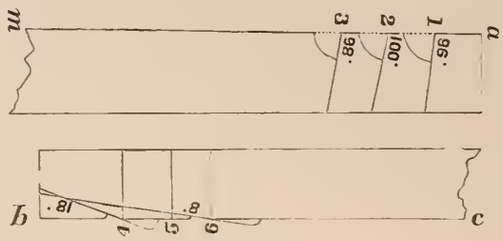


Fig 36.

am, which, when applied in use, coincides with the line of the detent. Or, what is the same thing, it forms an angle of 96° with the straight edge, on the side where the figures are, or of 84° on the lower side of the line. The size of the notch is made sufficient to slip around the largest pallets. The notches may be made close together, and the length of slip projecting above the notch, 1, need only be sufficient for convenience—say half an inch.

556. To use this pallet gauge, apply the straight edge over the detent, preferably as it stands ready for operation in the movement—as it may spring into a different shape when out and free, so that it will stand over and coincide with the dotted line *am*, in Fig. 35, *i. e.*, at the foot of the detent it will be over the center of the screw hole, and at the pallet it will pass through the point of repose of the tooth when locked upon it, wherever that may be, but which should never be further from the edge than one-fourth the breadth of the locking face. If the inclination of the pallet face is according to our directions it will then exactly coincide with the straight line of the notch which is pressed against it. A slight discrepancy may be overlooked, in a completed movement, unless you are putting the escapement in perfect order. But if the pallet face differs much from the notch line, say more than 2° in either direction, it should be altered till they will fit together closely, while the straight edge stands over the detent line as described. Any English pallet found to have the above angle between its face and the detent line may safely be pronounced correct as to the amount of its draw. The notch 1 is for English detents; notches 2 and 3, for the Swiss.

(557) Another style of pallet gauge is shown at the bottom of Fig. 36. It may be preferred by some for use with the Swiss detents, which, being pivoted, prevent the edge of the other gauge from going to the center of the detent staff. Notches can be cut in the edge at that part of the gauge to admit the staff, so that the edge can reach the detent line, *am*, but these notches may not be in the right places in all cases, and they also may make it a little uncertain about getting the straight edge just over the detent line. In addition, the detent cock is apt to be in the way, unless that part of the gauge is narrow enough to slip in between the cock and staff. With the lower gauge the line *bc'* should be caused to coincide with the same line in Fig. 35. That is, when the straight line at 4 is applied to the English pallet face, the line *bc'* should stand exactly over the center of the escape wheel pivot, and over the point of repose of the tooth on the locking face of the pallet. The line at 4 forms an angle of 18° with the line *bc'*, for the English detent. The notches 5 and 6 are for Swiss detents. This gauge is applied from the right hand side, or from the direction of the balance; the former, from the outside of the detent, or from the edge of the movement. Both are best used with the detent and escape wheel in place, while the balance and the escape wheel end stone are removed.

(558) In making the latter, the line *bc'* is first deeply marked along the length of the strip, which should be, say half an inch long from the lowest notch to the end. The other end extends out far enough for a convenient handle. The notches are made close together, as before. In making the straight sides of the notches, measure the angles on a large scale on some metal plate, or even on stiff paper, drawing the lines clearly, and as long as the radius of the protractor,

then lay the gauge over the drawing, and mark the inclined lines shown marked 8° and 18°. The three cross lines are for clearly showing the exact point where the inclined lines cross the straight edge *bc'*, which point is to be placed exactly at the locking point of the tooth on the face of the pallet when testing. Finish by carefully filing up the edge and notches to exactly correspond with the lines as drawn, making the edges "square," or at right angles to the flat surface of the strip. Both gauges are good, but, but the former is preferable whenever it can be used, from having a longer principal line, which can therefore be adjusted in position more accurately than a short one. But it is still better to have both, and use the one best adapted to the case. By the use of the Angle Meter, the precise angle of the pallet face can be measured in any circumstances, as will be described hereafter.

(559) Many workmen examine the amount of the "draw" while the watch is running, by looking between the roller edge and the point of the tooth which has just given the impulse. If there is too much "draw," the recoil of the wheel will be visible by the point of the tooth approaching the roller edge during each unlocking. But it requires a sharp eye and much experience to decide when the draw is just right by this test. Another "eye-test" is to sight along the pallet face when the watch is still. The line of sight should be between the escape wheel pivot and the line of the front face of the locked tooth, and nearer to the latter, as the face of the tooth must be 26° from the line *bc'*, while the (English) pallet face is only 18° therefrom, or only 8° from the line of the tooth.

(560) When we alter the draw, (550), we shall also change the position of the locking point, as will be evident by inspecting Fig. 35. If we increase the draw, we shall raise the locking point, so that the wheel will be held further back, when locked; and the reverse will be the effect of lessening the draw. Examine the distance of the teeth from the roller edge, for which purpose there is generally a hole or notch in the plate so located so that you can see the teeth on both sides of the roller. If the two teeth are not equally distant from the edge, when locked, the one at the left should be the nearer. But if either one is too close for safety, the detent must be moved forward or back to correct the fault. In a pocket chronometer the detent can be moved towards or from the balance by simply altering the steady pin, as the screw hole in the detent foot is generally elongated instead of round, admitting of moving in the direction of its length. The same object is accomplished in the box chronometer in the same way, but here the screw thread is cut in the detent foot, the slot being now in the plate. When the screw holes are round instead of oval, they can be filed out to suit. But the breadth of the hole must be no greater than will allow the screw to move, so that the detent foot cannot vary its position sideways.

(561) Considerable attention has been given to this point, not only because it is important to have the correct amount of draw, but to show the workman how many different ways may be found to test the same thing. In every case he should try to study out, for himself, the best ways to ascertain the exact condition of the part he is examining, not depending entirely upon those which are described, for it would be tedious to detail all the methods of testing every point. It is intended, however, to treat this escapement pretty fully, as the causes of tripping are often so obscure as to puzzle the most experienced workmen to detect. It is only by insisting that every part shall be as it should be, that success can be assured. Although this is so obviously true, it is astonishing to note how generally it is disregarded. The inclination of pallet face, for example, is more often found wrong than right,—the workman appearing to think it either of little consequence, or too minute and obscure to be meddled with. We have seen that, with proper attention, the inclination can be both tested and correctly adjusted. As to its importance, sections (553, 554), on the different cases of tripping caused by an improper inclination, are conclusive. Another instance will be given in the sections on the tiffness of the detent spring.

Dissolving Soft Solder.

GENERALLY speaking, old work, which has to be repaired, regilt, or colored, contains soft solder, the result of being mended by inexperienced persons; all this must be removed or destroyed before the articles can be properly repaired. It is a general belief among workmen that annealing and boiling out will destroy it, but it really has a contrary effect, the heat thus given tending only the more closely to amalgamate the solder with the gold. We have often tried to remove the solder after the annealing process by scraping and filing, and have always found that it had penetrated so deeply into the gold, that it would be utterly impossible to eradicate it by any such means. One of the common methods of treating this class of solder in the workshop, is to remove whatever you can by means of the scraper (which consists of a three-square file sharpened at the point), and then to place the article in tolerably strong muriatic acid for some time. Nitric acid is a much quicker way, but it cannot be safely applied to articles of inferior qualities of gold, as the acid would act upon the alloy of which they are partly composed; but for colored gold it may be used with advantage and safety. From a long practical experience in the matter of soft solder, we have arrived at the conclusion that there is no better way of treating it than that which we are about to point out. Before, however, describing our hitherto secret method of treatment, it is desirable that we should explain (for the benefit of those workmen who are continually meeting with this kind of solder in their daily work, much to their annoyance) another system for its removal; one, we believe, solely practiced by a few in this country, for we have never yet met with a person who knew anything about it. The solvent employed was a mixture of muriatic acid and crocus (jeweler's polishing material), and prepared as follows: To eight ounces of muriatic acid add one ounce of crocus, and well shake it, in order that it may become perfectly mixed; of this mixture take one ounce, and add to it four ounces of hot water, place it in a pipkin, and keep up the heat by means of a gas jet; put the articles containing the soft solder into it, and soon the desired result will be achieved.

But the plan most to be recommended, because the best of all we have been enabled to bring to bear upon this subject, is one which occupied us a long time, both in its consideration and accomplishment, and may therefore be safely applied to all classes of work, irrespective of quality. It can be adopted in the case of silver goods if desired, and that without any injurious effect whatever, whilst the time it takes to do the work is reduced to the minimum.

The destruction of the solder under this plan is effected as follows:

Proto-sulphate of iron . .	2 ozs.
Nitrate of potassa . . .	1 "
Water	10 "
	13 ozs.

Reduce the proto-sulphate of iron (green copperas) and nitrate of potassa (saltpetre) to a fine powder, then add these ingredients to the water, and boil the preparation in a cast iron saucepan for some time; afterwards allow the liquid to cool, and in doing so it will shoot into fine crystals; if any of the liquid should remain uncrystallized, pour it from the crystals and again heat it, when, on cooling a second time, it will have become crystallized. The crystallized salt should then be taken and dissolved in muriatic acid (spirits of salts), in the proportion of one ounce of salt to eight ounces of acid. Now take of the latter preparation one ounce, and add it to four ounces of boiling water in a pipkin, keeping up the heat by she means already stated. In a short space of time the most obstinate cases of soft solder will be cleanly and entirely removed, and without the work changing color, if these instructions are properly carried out in preparing the mixture, etc.

THE production of crystallized alumina in the form of corundum, which is the substance of which a number of oriental gems, and especially of rubies and sapphires, has engaged the thoughts of several experimenters, but hitherto only microscopical crystals have been produced. MM. Fremy and Feil, have lately succeeded in obtaining specimens which may be used in watchmaking, and may be cut by the lapidary. Their method consists in heating for a long time at a red heat, a mixture of aluminate of lead and silica. Thirty killogrammes of the mixture were thus treated for twenty days. The alumina is gradually liberated, and crystallized. It thus gives colorless corundum, but if two or three-hundredths of bichromate of potash be introduced into the mixture, this acquires the color of rubies. With a little oxide of cobalt the sapphire is obtained. The reproduction is exact as regards density, hardness, brilliancy, color, and even, as M. Jannettaz has observed, crystallographic and optical properties.

Proceedings of the Horological Club.

A Distinguished Body of Watch and Clock Makers.

Forty-seventh Discussion.—Communicated by the Secretary.

TOOL FOR SETTING RUBY PINS.

Secretary Horological Club:

I send thee an article to present before the Club for their examination and opinion. It is intended to be used to set ruby pins, especially one that is too small for the hole in roller. To use it, press in the side spring till the jewel can be slipped between the end of spring and notch in end of tool. Then place the roller under the end of top spring and push the ruby pin up through the hole to the right place, and cement it there in the usual way. When cool, it will be found to be plumb in every respect. I do not claim to be its sole inventor, but advanced some of the ideas. There are other advantages it has, which will present themselves to the user of the tool. With good wishes for the Club, I remain thy friend, E. S. C.

This tool consists of a slip of brass 1 7/8 inches long by 3/16 broad, and 3/32 thick. On one broad side, at the end, is screwed a piece of American size mainspring, bowed up in the middle, but having 1/4 inch of the other end resting flat on that end of the slip, and reaching about to the corner,—the end of the spring being hollowed out a little. On one of the edges a narrower spring is screwed, and bowed up like the other, but at its further end it lies along the edge about 1/16 inch, being filed down to about half the width of the rest. This narrow part fits loosely in a grooved cover piece, 1/4 inch long, soldered on the edge of the slip, keeping the spring in place. After passing through this slot to the corner, the spring is bent at right angles and fits the end of the slip, and is again bent around the other corner, fitting for about 1/16 inch into a groove cut into that edge of the slip. By means of this groove and the slot, the opposite edges, the spring is kept in place across the end of the slip.

The effect of pressing on the bow of the spring is to slide the narrow part forward through the groove, and carry the bent portion away from the end of the slip; on releasing the bow it returns and hugs the end of the slip, thus holding anything placed between them. The end of the slip is filed off perfectly "square" both ways, and at the centre of its breadth a shallow vertical notch is filed for holding the ruby pin. When the roller is laid on the flat surface of the slip, and held by the end of the broad spring pressing on it, the ruby pin in the notch will be held perpendicular to the surface of the roller. It only requires to place the hole of the roller over the ruby pin in the notch, which is then pushed up into the hole,—the spring allowing it to be so moved, and holding it wherever placed,—then apply the shellac, and heat as usual.

The tool was generally approved by the members as being simple, easy to use, and apparently very efficient. As nothing was said about its being patented, it would be inferred that its use was free to workmen who chose to make one. Mr. E. S. C. has the thanks of the Club for making his invention known, and we hope that others who have similar labor-saving devices will follow his example. If all would do this, we should soon have a collection of convenient contrivances which would greatly lighten the labors of our trade, and raise the average quality of work done.

REPAIRING CELLULOID JEWELRY.

Secretary Horological Club:

In looking over your paper we noticed inquiry from a party how to mend celluloid, and that Mr. Clerkenwell replied, "glue." Allow us to suggest "spirits of camphor," or liquid celluloid, same as we use. It will unite parts, and make as if not broken.

E. C. Penfield & Co.

Mr. Clerkenwell expressed the thanks of the Club for the information conveyed by the above letter. The camphor probably softens or partially dissolves the surfaces, which, when pressed together, become almost as one piece. New materials are all the time being brought into use, and in dealing with them the general workman must use such means as his past experience points out as likely to be adapted to them, until the special knowledge possessed by those engaged in their manufacture shall become generally dessiminated. The writers were to be commended for their liberality in communicating this information. He regretted, however, that they had not given more full description of the "liquid celluloid," how used, etc.

As appears from the business card of these gentlemen, they are engaged in the manufacture of the "Celluloid Truss," the springs of which are coated with celluloid. This truss received a medal at the Centennial "for general excellence of material as a coating for steel springs, resisting perspiration, for beauty of finish," etc. This suggested to him another point which might be of interest to many in our trade, and who had asked for methods of preventing rust on iron and steel. If this material, when applied to steel springs, would bend with them without cracking or scaling off, it would have a great variety of industrial applications. We should be pleased to hear further from these gentlemen and others conversant with the employment of this material, as to the "liquid celluloid, the mode of applying to steel springs, and other uses, its cost in small quantities," etc.

CEMENT FOR MENDING CELLULOID JEWELRY.

Secretary Horological Club:

I see in the January number C. H. is inquiring how to mend celluloid jewelry. This is a very good receipt: Make a collodion by mixing 10 oz. ether, 1 oz. alcohol, 12grs. gun cotton; color with red aniline, and apply as cement. The above is very strong, and the same color as the celluloid. If it gets too thick, put in more ether. Keep well corked, or it will evaporate. Smith.

Mr. Clerkenwell was very glad to see so many of our readers taking the trouble to forward information on the various questions brought up before us. Very often a workman may have some way of doing things which he makes answer all purposes in the absence of a better one—as in mending celluloid with glue. But if anybody else has something specially fitted for a particular use, and will inform us, like the Messrs. Penfield & Smith, we are not only willing, but glad, to be corrected or enlightened. Mr. Smith's cement, when colored as he describes, is suitable for mending celluloid, coral, etc., and by omitting the aniline, it would be a white cement, fitted for many other uses. Or it could be given any desired tint by adding the corresponding aniline dye. But little of the coloring matter need be used, as the anilines have an enormous power of diffusion, and the merest trifle will give a decided tint to a large quantity of liquid.

We should also be pleased to hear from Mr. Smith on the other questions which he intimates that he could answer satisfactorily. This invitation is likewise extended to the trade at large. Let every reader feel specially invited to consider himself a contributor to this department of any recipes or "wrinkles" in working, which he knows by experience to be good and reliable. It will cost but a few minutes of time and three cents for postage. We will publish his full name, or only the initials, as he prefers.

REGULATING FINE WATCHES—EXCELSIOR'S BOOK.

Secretary Horological Club:

I have lately seen a table of contents of a book by "Excelsior," entitled, "A Practical Treatise on the Balance Spring and the Compensation Spring." Among other things it says, "How to fit and regulate a hair-spring in one hour." Can that be done? If I get one fitted and fully regulated in a week I think I am doing well enough. "How to regulate a varying watch." What is a varying watch? and is it regulated any different from common watches? "How to regulate a fine watch without injuring its adjustments." If I have a fine watch that gains or loses a little, and I turn the regulator, will that injure its adjustments? If it does, I don't see how we are going to regulate it at all. "How to regulate watches without regulators." I always supposed that such watches had their hair-springs taken up and let out till they were just right. Is there any other way to do it? What does the Club think of this book? I don't want to pay out $3.50, unless it is something of use to a practical workman. Is it for common workmen, or only for such as understand algebra, geometry, and all the ologies? A candid answer to the above will confer a great obligation. C. H.

Mr. Isochronal replied that, by following "Excelsior's" instructions, the ordinary flat spiral hair-spring could be fitted and pretty closely regulated in an hour. And it would be fitted as it ought to be. Many workmen think that if they get a spring of about the right size and stiffness, and make it come within a minute or two in a day, they have fitted it in properly, and all it will want is a little regulating. But when they come to try it they find that there is no regularity to it, and it can never be depended on to be two days alike. In other words, they cannot regulate it. There is a certain way that the two ends should stand, a proper shape at both the collet and the stud, etc., etc. It is about as easy to have it right, if one only knows how it should be, and this "Excelsior's" book tells, giving full directions for all possible circumstances.

A varying watch is one that does not keep the same rate through the twenty-four hours. It may gain in one part of the day and lose in the other part. This is generally caused by an improperly fitted hair-spring, and the proper remedy is either to make it correct, or put in a new one as it should be. But by observing certain rules, which "Excelsior" details, such a watch can be regulated tolerably closely, without altering or changing the spring. This is often a great advantage, especially when the watch is a cheap one, or the owner would not pay for the trouble of rectifying the fault.

Regulating a fine watch is more of a science than the majority of workmen imagine it to be. Sometimes the regulator must be moved, in other cases it must not, but the hair-spring should be taken up or let out; or its shape altered; or the regulator pins opened or closed; or the screws in the balance rim altered; or the strength of the main-spring changed; or the balance pivots or their jewels altered, etc. Which should be done will depend on the particular conditions of each case, but if any course except the right one is adopted, the watch is certain to be injured by it. What to do, and when, and how, is fully described in the book, but would take too long to repeat here. Regulating watches without regulators is done by moving certain screws in the balance rim, called the "timing" or "quarter screws." None of the other screws must be touched, as that would destroy the adjustment for heat and cold. The quarter-screws must be altered in a certain way, or both that adjustment and the poise will be disturbed. In some cases the watch must not be regulated at all, but simply let alone for a time, and then set again.

In short, this is a subject of much more importance than C. H. seems to be aware of, and he should not let another day pass without sending for this book. The regulation of watches is but a small part of its contents, but a knowledge of even that part may often repay the cost of the book in a single job, if time and reputation are of any account. Although it treats of the most important and intricate subjects which the practical watchmaker is concerned with, it is entirely free from abstruse mathematical *formulæ* or reasoning, explaining every point fully in ordinary language, such as any intelligent workman can understand. In this respect it differs from all other works on these subjects, being strictly practical, and is adapted for the use of all classes of workmen, from the apprentice who needs elementary details, to the most experienced, who will find it a careful summary of the results reached by the researches and experience of the most eminent mathematicians and horologists, as well as of practical manufacturers and workmen.

He had said so much about this book because he thought it ought to be in the hands of every watchmaker, and no one would ever regret having purchased it. His own observation coincided with the statement of D. H. Hopkinson, Esq., that its publisher, he has found it an invariable rule, that the greater the experience and skill of the workman, the more enthusiastically does he commend the value of this work. Mr. C. H. may with all confidence depend upon its teachings as giving the best and most reliable practical methods of doing work. As to the opinion of the Club, we have repeatedly endorsed not only this book, but all of "Excelsior's" articles. For the benefit of C. H. and other new subscribers to the CIRCULAR, we copy the resolution unanimously passed by the Club at its meeting for June, 1876: "That the Club officially endorses it to our fellow workmen everywhere as the most full, trustworthy and practical treatise on the balance spring, the compensation balance, and the different adjustments required in watches and chronometers, yet published anywhere." Our opinion of it is still the same, as is demonstrated by the fact that "Excelsior's" writings are accepted as our standard authority on all disputed questions of that kind which arise in our discussions.

Mr. Clerkenwell then gave some instances of the need of the instructions contained in "Excelsior's" book. He was in a leading store in a certain city when a strange lady came in with a very fine watch with Breguet hair-spring, and compared time. "Why," exclaimed she, "it has gained six minutes this week, and before it only lost three minutes in two weeks. What did you do to it?" The workman replied that he had only moved the regulator ahead a little, and offered to move it back again. She would not allow him to touch it, but went off declaring that he had spoiled it. The probability was that he had moved the regulator on to the terminal curve, and so caused all the trouble.

In another city, a gentleman handed in a chronometer which had lost a few seconds since the previous day. The watchmaker opened it, and deliberately put his screw-driver against the terminal curve, near the stud, and *bent* the spring toward the balance staff! After the owner had gone, Mr. C. asked the workman how that would make the watch gain. "Why," said he, "there was no regulator, so I bent the hair-spring against the balance to make it run a little harder, and that will make it run faster." This was no apprentice, but a high priced workman, getting thirty dollars a week, who could talk in pompous words about isochronism, heat and cold, compensation, etc. He might be a good finisher or lathe hand, but he certainly was a botch watchmaker, and if he don't get horsewhipped by some indignant victim, he will not meet his deserts. It was astonishing to find how few workmen really knew anything above chalk and spit—scourer, hammer and file. He thought that everyone should urge the introduction of this and other good works on these subjects, to raise the trade out of the low estate into which it had fallen in the public mind, by giving workmen reliable information, enabling them to do good work, and so making our calling respectable and respected.

READY-MADE PIVOT DRILLS FOR WATCHMAKERS.

Editor Jewelers' Circular:

Your JEWELERS' CIRCULAR being renowned for supplying the trade with the best of practical information, your readers certainly will feel obliged if you call their attention to a new and fresh article that is fully adapted to sustain the truth of the proverb, "Time is money," and has met with such a success as no other novelty ever found in Germany. You very well know, and every watchmaker knows, how difficult it is to make a regular and good, *really good*, *pivot drill*, and what time it takes to grind the drill into the necessary dimensions, this latter manipulation to be perpetually renewed. To avoid this, to save time, to be facilitated in their task, people only need buy our "drills assortment," and they always have a drill ready for use at their disposition. Our "drills assortment" consists of 126 different drills, in 21 different numbers (Nos. 1 to 12), every number representing the diameter of the drill by one-tenth of a millimeter, thus: No. 3 being $\frac{3}{10}$ of a millimeter. The numbers run by ½ tenth of a millimeter, beginning from $\frac{1}{10}$ of a millimeter and proceeding as far as, $\frac{2}{10}$ millimeters, equal to No. 12. These drills are made of the best quality of steel, perfectly hardened for all metals, and ready for use. They are accompanied by two drill stocks, corresponding to the two strengths of steel the drills are made of—the small drill stock serving for the lower numbers, the large one for the higher numbers of drills.

Now, when a workman wants to bore a hole, all that is required to do is to choose the necessary number of drill and put it into the drill stock. The utility and convenience of our "drills assortment" must be appreciated by every watchmaker, and we do not in the least doubt that if you, Mr. Editor, make the public acquainted with this improvement, and write a few lines in your next paper, your readers will feel obliged to know about it. By sample post we send you such an assortment that you may judge for yourself whether we have said too much in its favor. These drills found a very ready sale in Germany since we introduced them into the market. They can be had

at all wholesale houses, and are furnished in special numbers as well as by full assortment.

We are, sir, yours very respectfully, KOCH & Co.

The foregoing letter was handed in by Mr. McFuzee, to whom the Editor of the CIRCULAR had passed it over, with the sample "drill assortment," for examination. Mr. McFuzee reported that the statements in the letter were fully sustained by the facts. The drills were really well proportioned, well hardened and tempered, well sharpened and finished,—good and substantial working drills. The angles of the two cutting edges were from 60° to 80°, the cutting faces were uniformly ground down with straight flat surfaces, and the diameter was fixed by grinding off the corners of the flatted part, with the point exactly in the centre, and both the point and the corners well formed for strength. Back of the head it was turned down from ¼ to ⅓ smaller, meeting the body of the wire with a conical shoulder. The length from the point to the beginning of the cone varied from four to six times the breadth of the drill, and some were even longer. In short, all the conditions for giving strength and durability, as well as the best working proportions, seemed to be fully met, and he could unhesitatingly recommend them. The first five or six numbers comprised all the sizes generally required for ordinary pivoting, the larger sizes being adapted for other work, or for extra large pivots, etc. As was stated, the No. 1 drill corresponds to No. 8 on the ordinary pivot guage. No. 12 is about $\frac{1}{20}$ inch diameter.

The two drill stocks were also substantial and well made, with hardened points, etc., and two extra screws to each. Altogether, he regarded this novelty with decided favor, and predicted that it would meet with even greater success in this country than it had in Germany. He regretted that Messrs. Koch & Co. had not given the prices, or at least some directions for obtaining them. When anything of real merit is brought to our notice, we do not hesitate to give all the information concerning it needed by our readers, even if this involves a certain amount of advertising free of charge. Doubtless some enterprising material importer will soon be able to supply them to all who desire them. He had often wondered why nobody would undertake their manufacture, for certainly nothing could be more needed or more welcomed by watchmakers than good finished pivot drills. We should be pleased to hear again from these gentlemen, with the prices, a general description of the mode of manufacture, etc., etc. Also from other parties, either at home or abroad, who have novelties of value to our trades.

FROSTING AND RAYING STEEL WATCH WHEELS.

Secretary Horological Club:

In Mr. Uhrmacher's reply to W. S. H.'s inquiry, how the white frosted surface is produced on the stem-winding wheels of watches, he says, "The frosting is generally accomplished by stoning." When curves, circles or other lines were used, that was done with a tool made for the purpose. "It would take too long to describe the making of the tool and the process of using, and, besides, it would be of no benefit to the majority of watchmakers, as they could not do it without fitting up things for that special object."

Now, if you will allow me the privilege to differ with our worthy brother, Mr. Uhrmacher, on the above question, by stating the fact that there are a great many watchmakers, scattered all over the country, who possess the American combination lathe with the *grinding tail stock attachment*, which is capable of producing quite a variety of styles of raying curves or circles, and I am sure there is not one of those who does not take an interest in producing work which his lathe is capable of, if he had the necessary information. I, for one, feel interested in this subject, and hope Mr. Uhrmacher will reconsider his idea of the "no benefit to the majority of watchmakers," and give us more light upon the subject, without entering into the description of a regular raying machine. GREASER.

BALTIMORE, January 21, 1878.

As Mr. Uhrmacher was ill at home, the chairman suggested that Mr. Greaser, who is known to us as an excellent workman, should give us his method of raying with the ordinary lathe attachment,—describing the parts, modes of working, materials used, etc. Any of our readers who are not fully satisfied with answers given by the Club are invited to send us accounts of methods which they consider better.

POLISHING JEWELRY.

The Secretary reported that a letter had been mislaid, written by a gentleman asking for information about polishing jewelry. He would find description of the process on page 190, in the December number of the CIRCULAR. The hour being late, the Club then adjourned, leaving two or three communications till next month.

PERSONAL.

We are deeply pained to announce that two of our members have backslidden from the true horological faith, and no longer attend at the regular services of the Club. Mr. Screwsqueezer says he don't feel at home here, on account of the preponderance of "them darn literary fellers," and the Adjuster-of-the-French-School is very indignant at being continually choked off whenever he attempts to enlighten the world with his incomparable disquisitions on matters and things in general. Efforts are being made to heal the breach, and induce our erring brethren to shake hands across the bloody chasm. If there is a hell a question which had not been settled up to the hour of meeting, the Club has a firm conviction that the two W.'s will suffer its direst torments, unless they return to the fold forthwith, and renew their allegiance to this distinguished body.

An Ingenious Clock.

A PENNSYLVANIA watchmaker by the name of Stephen D. Engle, has completed a very curious clock, rivaling in ingenuity that celebrated horological wonder at Strasburg, and is described as follows: The Engle clock stands eleven feet high. At its base it is about four feet wide and at the top about two. It is about three feet deep at the base, gradually less towards the top. Its colors are dark brown and gold. The Strasburg clock is thirty feet high, yet its mechanism is not so intricate, nor has it as many figures as this clock. The Strasburg clock's figures are about three feet high, and the American clock about nine inches. Three minutes before the hour a pipe organ inside the clock plays an anthem. It has five tunes. Bells are then rung, and when the hour is struck double doors in an alcove open and a figure of Jesus appears. Double doors to the left then open, and the apostles approach slowly, one by one, in procession. As they appear and pass Jesus they turn towards him. Jesus bows, the apostle turns again and proceeds through the double doors in an alcove on the right. As Peter approaches Satan looks out of a window above and tempts him. Five times the devil appears, and when Peter passes, denying Christ, the cock flaps its wings and crows. When Judas appears Satan comes down from his window and follows Judas out in the procession, and then goes back to his place to watch Judas, appearing on both sides. As the procession has passed, Judas and the three Marys disappear, and the doors are closed. The scene can be repeated seven times in an hour, if necessary, and the natural motion of the clock produces it four times per hour, whereas the Strasburg procession is made but once a day, at 12 o'clock. Below the piazza is the main dial, about thirteen inches in diameter. To its right is a figure of Time with an hour-glass. Above this is a window, at which appear figures representing Youth, Manhood, and Old Age. To the left of the dial is a skeleton representing Death. When the hour-hand approaches the first quarter, Time reverses his hour-glass and strikes one on a bell with his scythe, when another bell inside responds; then Childhood appears instantly. When the hour-hand approaches the second quarter or half hour there are heard the strokes of two bells. Then Youth appears, and the organ plays a hymn. After this, Time strikes two, and reverses his hour-glass, when two bells respond inside. One minute after this a chime of bells is heard, when a folding door opens in the upper porch and one at the right of the court, when the Saviour comes walking out. Then the apostles appear in procession. The clock also tells of the moon's changes, the tides, the seasons, days, and day of the month and year, and the signs of the zodiac; and on top a soldier in armor is constantly on guard walking back and forward. As the hours advance, Manhood, Old Age and Death take part in the panorama

Precious Stones and Gems.

BY EDWIN W. STREETER.

THE diamond has a perfect cleavage, parallel to the faces of the octahedron, which is its primary form. The diamond cutter avails himself of this. He is thereby enabled to remove portions damaged by rough spots, without resorting to the weary work of grinding. The fracture is conchoidal, and here and there liable to split off in fragments. Notwithstanding the great hardness of the diamond, it is so brittle that it can be pulverized in a mortar.

In addition to the property of cohesion, the diamond possesses pre-eminently that of hardness; a quality in which it so exceeds other bodies that it can penetrate them all without itself being even scratched, and for this reason formerly it was only possible to polish it very partially, and to use it in its natural crystal form.

In early times there existed such an exaggerated idea of its extraordinary hardness that it was said a diamond could not be broken by a hammer on an anvil, and that it was far easier to strike the anvil into the earth than break the diamond.

It was upon this notion that the anvil test was applied for proving the genuineness of the diamond. Many a good diamond has been shattered and so lost because its brittleness was really tested by the hammer, and not its hardness which is a very different quality.

Pliny gives a detailed account of the diamond in his "Natural History," xxxvii., 15. He says: "The most valuable thing on earth is the diamond, known only to kings, and to them imperfectly. * * It is only engendered in the finest gold. * * * Six different kinds are known. Among these the Indian and Arabian, of such indomitable, unspeakable hardness, that when laid on the anvil it gives the blow back in such force as to shiver the hammer and anvil to pieces. It can also vanquish fire, for it cannot be burnt. * * * This power over steel and fire is broken by goat's blood, in which it must be soaked when blood is fresh and warm, and then only after many blows, and when hammer and anvil have been both in pieces, will it yield. * * * Only a god could have communicated such a valuable secret to mankind. Even when it yields by means of the blood, it falls into such small pieces that they can scarcely be seen." This was the standpoint of the ancients in relation to the diamond.

Hardness is the best test of the genuineness of a diamond. If a mineral cannot be scratched or cut by ruby or sapphire, it can only be a diamond. The officers of the "Junta Diamantina," in Brazil, test the genuineness of two rough diamonds by rubbing them together close to the ear, when, if they be real, they make a peculiar creaking or grating noise, which is easily recognized by the testers.

The conditions which the diamond presents in relation to light are very remarkable. It belongs to those bodies which refract light most strongly. The magnifying power of a diamond is greater than that of glass, hence it is sometimes used for microscopic lenses; but owing to the great difficulty of making them perfectly accurate, their use is much restricted, and very few good ones are made.

Newton arrived at the conclusion that the diamond must be a combustible substance; partly from the following consideration, viz.: the relative density of quartz and diamond is as 3 to 4, but the refracting power is as 3 to 8; therefore he concluded that the diamond could not be an incumbustible body.

In addition to its property of strong refraction, the diamond possesses the power, in an extraordinary degree, of reflecting the colored rays of light, and causing what is technically termed the "play of colors" observable on a well cut diamond.

As the value of a diamond depends very materially upon this play of colors, many methods have been assayed from time to time for testing it. Babinet recommends the following plan, which he himself was in the habit of employing. In a sheet of paper he bored a hole somewhat larger than the diamond to be tested; he let a ray of sunlight pass through the hole, and holding the diamond a little distance from it, yet at such an angle as to allow the ray to alight on a point of the flat facet, he found this facet to be forthwith represented on the paper, as a white figure, whilst all around little rainbow circles were delineated. If the observer found the primary colors, *i.e.* red, yellow, and blue, definitely separated one from the other in these little circles, and if their number were considerable, and they stood at equal distances from each other, then he pronounced the brilliant to be well cut.

In the rose the light reflects from the underplane, and produces a similar effect to that seen in the brilliant.

The diamond does not possess the power of double refraction, neither does it polarize light; although, according to Brewster, there are sometimes internal air bubbles as in amber, by which the course of the light is somewhat altered. Since on the outside of these air bubbles light passes through perfectly unpolarized, it appears that the mass was originally so soft that the enclosed air could by expansion change the part lying nearest to it, just as one is able to produce similar results by pressure in glass and resin. Such compression on the mass close to the air bubbles, Brewster declares to be nowhere found among minerals produced by the operation of heat; and he concludes, therefore, that the softness which the diamond without doubt formerly possessed was that of a half-dried gum. This deviation in refraction has given rise to the erroneous belief that the diamond possesses double refraction.

The lustre of the diamond is the peculiar, indescribable, but well-known *adamantine lustre*.

The refracting and reflecting properties of the diamond are very trifling in the rough, compared with the cut and polished stone.

The surface of the native crystal is often rough with little rents and flaws, and has a peculiar leaden-grey semi-metallic lustre, somewhat like small lumps of gum-arabic.

The diamond generally, and in its purest condition, is colorless and transparent; yet at times it is found colored, but only slightly, with pale-yellow, ochre-yellow, light botttle-green, yellowish-green, blackish-green, blue, red, and from brown to black. Next to yellow, green diamonds are most numerous; the blue are very rare, and not of a bright tint. When the diamond is between brown and black its transparency entirely disappears, or is seen only at the angles.

Entirely colorless diamonds come from the mines in India, Brazil, the Cape, and Australia. One-fourth of the diamonds are colorless; one-fourth, of "pure water," with a stripe or spot of color; and the remainder colored.

The colored diamonds preserve their lustre and clearness best when they are cut; especially the beautiful yellow ones, which, by candle-light, almost surpass in brilliancy the diamonds of pure water. Diamonds can be grouped according to their shades of color.

Barbot, by means of chemical agents and a high temperature, is said to have succeeded in removing the coloring matter from the rough diamond; green, red, and yellow stones becoming perfectly colorless; while the dark yellow, brown, and black, gave up very little of their color. It seems scarcely possible that this can be accurate. In many diamonds the core is not pure, but shows blackish or greenish spots. This is particularly the case in the green stones. Many diamonds show also "feathers" and fissures, which materially modify the passage of light.

Black diamonds of great beauty are occasionally supplied by Borneo. These are so remarkably hard that the ordinary diamond dust makes not the smallest impression upon them; and they can only be cut or polished by using their own dust for the purpose.

Phosphorescence is produced not only by great heat, but also by the action of light, even after subsequent isolation. The diamond becomes phosphorescent under the influence of the sun's rays, and remains so for some time after removal from the sunshine, even when covered with cloth, leather, or paper.

This property is most striking after the diamond has been exposed to the blue or more refrangible rays of the spectrum; under the red rays it is much weaker. In an experiment of Barbot's, it is said the diamond showed phosphorescence when he placed it under cover of limewood two millimetres (one-twelfth of an inch) thick, after it had been removed from the influence of the sun's rays.

The diamond is a non-conductor of electricity; and this is the more strange as graphite and charcoal, substances absolutely identical with it chemically, are very good conductors. By friction, however, both in the rough and polished state, it becomes positively electric, but loses its electricity completely in the course of half-an-hour.

Chemically the diamond consists of pure carbon. Newton concluded the diamond must be a combustible body, in consequence of its high refractive power. Robert Boyle, however, strove in vain to consume it in the crucible. For the purpose of investigating this supposed combustibility, the Academy of the Cimento, at Florence, in the year 1694, induced by the Grand Duke, Cosmo III., fixed a diamond in the focus of a large burning glass. The Academicians found that it cracked, coruscated, and at length disappeared, without leaving a particle behind.

In the year 1750, the Emperor Francis I., at Vienna, subjected in

the presence of the chemist, Darzet, diamonds and rubies worth 6,000 florins, for twenty-four hours, to the heat of a smelting furnace. The diamonds were found to have totally disappeared; but the rubies remained, and appeared much more beautiful than before.

Scientific men of France carried on these experiments; and in the year 1771, on the 26th July, a magnificent diamond was burnt in the laboratory of the chemist Macquer. Hence arose a great discussion. The fact was undoubted: the diamond had disappeared; but whither? Had it volatilized? Had it burnt? Had it exploded? No one could say. Upon this there stepped forward a celebrated jeweler of Paris, by name Le Blanc, who asserted the indestructibility of the diamond in the furnace, stating that he often placed diamonds in an intense fire to purify them from certain blemishes, and that they had never suffered the smallest injury I have conducted similar experiments, and generally with the same good results. The chemists, D'Arcet and Rouelle, then demanded of him that he should make the experiment on the spot in their presence. He took some diamonds, enclosed them in a mass of coal and lime in a crucible, and submitted them to the action of the fire. He had no doubt that he should find them safe. But, alas! he had sacrificed his diamonds; for at the end of three hours, on looking into the crucible, they had utterly disappeared. But the scientific men did not long enjoy their triumph.

Another jeweler, Maillard, in the presence of the celebrated Lavoisier, took three diamonds and closely packed them in powdered charcoal in an earthen pipe bowl, in a strong fire; and when the pot was taken out there lay the diamonds in the powdered charcoal untouched.

It was, however, gradually discovered that it was only by entirely shutting out the air and therefore the oxygen, with which the carbon combines, that the diamonds were preserved from burning; whereas, by the simple admission of air of which oxygen is a constitutent part, diamonds burn just the same as common coal. This fact Lavoisier proved in 1776; and Davy subsequently showed that the diamond contains no hydrogen.

It is almost unnecessary to say that the gas formed from the combustion of diamonds is carbon-dioxide carbonic acid Co^2, the gas yielded by every fire and gasburner, and by the combustion of our own bodies: these latter, in the combustion that attends their very living evolve carbon-dioxide by the lungs, so that the old fable of the maiden from whose lips fell diamonds may have a really scientific basis after all.

The temperature must be very high for the burning of a whole diamond. A much lower degree of temperature will be sufficient to burn diamond dust, if the latter be spread out on a red-hot, thin platinum plate, and put over a spirit-lamp. Small diamonds will burn in a very short time, if placed on a plate of the same metal, and the flame of a spirit-lamp be directed by a blow-pipe under the plate; upon raising the temperature to a very high degree, they will disappear entirely in a few minutes.

When a diamond is subjected to the sun's rays in the focus of a burning-glass, or heated in oxygen gas, it gives out bright-red sparks while burning. In order to see in what direction the diamond suffered during the process of combustion. Petzholdt took two sharp-angled pieces of diamond, and placed them before the oxy-hydrogen blow-pipe. Whilst undergoing this fierce heat, he removed them from the flame once or twice to watch the action of the fire upon their form and substance; he then detected that the heat had acted on the sharp angles, rounding thus the diamonds first; and on the re-application of the heat, he observed that the diamonds soon split up into pieces, and lost both their transparency and lustre. He could not detect any evidence of fusion on the surface of the burning diamonds; but, on removing them from the fire, they assumed a leaden-grey color, which is worthy of attention as an indication that this precious gem darkens or blackens in process of combustion. Lavoisier also noticed that on exposing the diamond to intense heat, black spots appeared on it, then disappeared, and re-appeared in the action of destruction by fire. Guyton de Morveau confirmed these statements. He consumed a diamond in oxygen, by means of the burning-glass. First he saw on that corner of the diamond which was in the exact focus of the lens a black point; then the diamond became black and carbonized. A moment after, he saw clearly a bright spark, twinkling as it were on the dark ground; and when the light was intercepted, the diamond was red red-hot and transparent. A cloud now passed over the sun, and the diamond was more beautifully white than at first; but as the sun again shone forth in full strength, the surface assumed a metallic lustre. Up to this point the diamond had sensibly decreased in bulk, not being more than a fourth of its original size; of elongated form, without definite angles, intensely white, and beautifully transparent. The experiment was suspended for a day or two, when, on its resumption, the same phenomena recurred, but in a more marked degree; subsequently the diamond disappeared. At the conclusion of his treatise, in which these experiments are detailed, he says, "If it were possible, while the diamond is burning, to collect the black substance which covers the surface, the diamond would indisputably be shown to be carbon:" that is, be recognized under the more generally known form of carbon, viz., charcoal.

Fourcroy corroborates Guyton de Morveau. He placed two small diamonds in a capsule, under a muffler, heated them, arrested the burning, suffered the half-consumed bodies to cool, and on removing the muffler he found them quite black, as though they had a covering of soot, which he removed by rubbing with a piece of paper, on which was left a black mark.

Clark took an amber-colored diamond, six times the size of that used by Guyton de Morveau, and subjected it to the action of the oxy-hydrogen blow-pipe. It was entirely burnt in a few minutes. The first action of the flame upon it, was to make it perfectly clear and colorless: it next became faint-white, and quite opaque in appearance, very like to ivory. In this stage its size and specific gravity were both lessened: next one of the angles of the octahedron disappeared, and the surface was covered with little bubbles, like blisters. Subsequently all the angles disappeared, leaving an elongated ball, with a strong metallic lustre; and after a short interval, there was no sign of a diamond having been there.

The Brothers Rogers say that with potassium chromate and hydric sulphate (sulphuric acid at from 180° to 230° the diamond is oxydized into carbonic acid. Jacquelaine and Despretz used very powerful galvanic batteries, and found that a diamond, in an atmosphere of carbonic acid, by means of the oxy-hydrogen-gas blow-pipe, or one fed with carbon-oxide and oxygen, gradually disappeared without any sign of softening. Gassiot also has experimented on the diamond by strong galvanic currents between carbon points.

(1) In burning the diamond, uncrystallized black carbon is produced. (2) Many rough diamonds possessing a metallic lustre become leaden-grey. (3) The blackish spots, adhering to the surface of some, may be got rid of by great heat.

No solvents, not even acids, have the slightest power over the diamond to dissolve or decompose it; in this it is distinguished from other precious stones, most of which, having silica in their formation, cannot withstand the influence of hydric-fluoride (hydro-fluoric acid H. F.

All the many opinions as to the origin and formation of the diamond can be collected under two heads: (1) The diamond is formed immediately from carbon or carbonic acid by the action of heat: (2) It is formed from the gradual decomposition of vegetable matter.

(1) Leonard says that the diamond is formed by sublimation of carbon in the depths of the earth; Parrot, that it is produced by the action of volcanic heat upon small pieces of carbon; Gobel, that pure carbon has been separated from carbonic acid by electricity in the presence of reducing agents, such as magnesium, calcium, aluminium, silicon and iron; Hausmann, that it is by the action of electricity, especially in the form of lightning, upon carbonic acid, that its decomposition is effected; and he quotes the statement of the Ancients, that in those mines where the largest number of diamonds were found were also found in large number the so-called thunderbolts.

(2) Among those who support the vegetable origin of the diamond, is Newton, who believed it to be a coagulated, fat, or oily body, having a vegetable origin: Jameson and Brewster advanced similar views: Petzholdt also decided for the vegetable origin; and Liebig, who undoubtedly made himself a great authority by his knowledge of the decomposition of organic bodies, says, "Science affords us no analogy, except that of decomposition and decay, for the formation or origin of the diamond. We know that it does not owe its origin to fire; for a high temperature and presence of oxygen are incompatible with it on account of its combustibility: on the contrary, there is undeniable ground for supposing that it was formed in the 'wet way;' and the decomposition process alone satisfactorily helps us in attempting to solve the mystery of its origin. What kind of vegetable substance, rich in hydro-carbons, was it the decomposition of which gave rise to the diamond, and what particular conditions had to be fulfilled in order to crystallize the carbon, are not at present known to us; but this much is certain, that the process must have been exceedingly gradual, and in no way hastened by a high temperature; otherwise the carbon would not have become crystallized, but would have separated itself as a black powder."

Wohler also is of opinion that the diamond did not originate in a high temperature, at least not by fusion.

G. Wilson held the view that the diamond might originate from anthracite or steam-coal, without a change from the hard state.

Later opinions seem to incline towards the diamond taking origin from some other form of the element carbon.

Various Processes of Coloring and Finishing.

BY G. E. GEE.

BEFORE entering upon an examination of this process, by which the surface of alloyed gold is changed into a rich and beautiful yellow color ; presenting, in goldsmith's work, a strikingly characteristic and most pleasing appearance, we desire to express the hope that we are not laying ourselves open to the charge of betraying trade secrets, our aim simply being to render a service which will prove useful to jewelers generally, as well as to manufacturers and workmen, by endeavoring (from a practical point of view) to explain in detail the real nature of a processes little understoood, and one which enriches and puts a finish upon their work.

Coloring to the goldsmith, is strictly a trade term, and means, the giving of color to an article after every other process of workmanship has been completed, and it is restricted by him to this particular process, which is one entirely chemical in its nature ; its effect is to give to gold of inferior standard all the appearance of fine gold itself. This appearance is not an imaginary one, nor is it a mere superficial coating of the surface with gold of a higher quality, similar to gilding ; but a peculiar and exact process of removing the base or inferior metal from gold behind that of a deep rich color, which no other process can equally effect. The simple fact is that gold-coloring is an effective process for refining the whole surface.

It is now about sixty years since colored gold was first introduced into the English market, in its manufactured state as an article of commerce. At that time, and previously, the English gold-workers were "bright-workers" only. The goldsmith's work of that period had a red-looking appearance, very similar to the now well-known *Albion gold* in point of color ; the finish produced then was differently effected from that of the present day, being due solely to polishing ; and upon the artificer in that branch, depended the beauty and excellence of finish which the work possessed. Articles of this description which are met with in the present day, are designated as articles made with the old red gold.

It has been said that the goldsmith who, by submitting his work to a chemical preparation, first produced a color never before obtained by any process, was a Frenchman. Since the introduction of the art as a French invention, it has seen many changes—both English and German—not only in the mode of its application and the shades of color produced, but also in the qualities of the gold operated upon.

There are two methods of coloring gold, called respectively the *dry coloring* and the *wet coloring ;* the materials employed are nearly the same in all cases : they are—1 part of salt, 1 part of alum, 2 parts of saltpetre.

Dry-coloring cannot be performed upon gold inferior to 18-carats. We shall give several processes for wet-coloring, with their respective qualities of gold, as arranged and practised by ourselves. But we now proceed to the details of the process of dry-coloring, and shall give our information in a methodical manner, in order to be the more plain and intelligible, and shall describe the various operations generally employed, upon each of which depends failure or success. Among those that take precedence will be found the—

ORIGINAL PROCESS OF DRY-COLORING.

This process for coloring superior articles of gold has been extensively practised by goldsmiths ; it is not so complicated as many, and therefore may be performed with less skill. This is decidedly the original one ; it requires the following materials :

Nitrate of potassa	8 ozs.
Common salt	4 "
Alum	4 "
	16 ozs.

The mixture should be reduced to powder and placed in a color-pot, or common earthen pipkin, and allowed to dissolve slowly ; this should be done over a fire that can easily be regulated, a gas furnace being the best for the purpose. The pot need only be large enough to give the work full play without allowing it to touch the bottom or sides, which would mark the articles dipped. It should be sufficiently filled with color, so that when it rises it would come to the top. While dissolving, the mixture should be well stirred with an iron stirrer ; it will then rise, and the work must at once be suspended in it by means of fine silver or platinum wire, and kept in continual motion until the liquid is about to sink in the pot, when the work must be taken out and at once immersed in clean muriatic acid pickle, which will remove the adhering color. The color in the pot will rise again after the withdrawal of the work, and of this opportunity advantage must be taken for a fresh dip. For plain work, generally two of these dips will be sufficient, but for hollow work three will be necessary. No description can give the exact time or explain the incidents connected with coloring ; sometimes it will be produced as quickly again as others, and this knowledge can be acquired only by actual practice.

In this process there is not so much danger of spoiling the work as in the subsequent ones we shall refer to, for so intense a heat not being required, it can safely be left in the mixture for longer periods. Moreover, if preferred, the quenching directly after the stated periods of withdrawing the work from the color, may be dispensed with altogether. The articles may be removed occasionally to ascertain if the mixture has operated sufficiently, and when this is made evident, they should be allowed to cool gradually, and afterwards immersed in perfectly clean sulphuric acid pickle, which will remove the adhering flux. After this is done, the articles must be rinsed in a weak solution of soda or potassa, then washed in hot soda and water, and finally rinsed well in clean boiling water and placed in clean warm boxwood sawdust to dry. Articles colored by this process may be burnished if deemed necessary ; but the above mode of permanently finishing seems to have found favor with many.

LONDON PROCESS OF DRY-COLORING.

The process of coloring is far superior in point of richnesss to wet-coloring ; it cannot, however, be employed for gold of inferior qualities. The new standard of 18-carrats can be subjected to the action of the mixture successfully, and this is about its utmost limit. It is performed in the following manner. Take—

Nitrate of potassa	8 ozs.
Common salt	4 "
Alum	4 "
	16 ozs.

Reduce these to a fine powder in a wedgewood-ware mortar, and well mix together ; then take a blacklead or iron-color pot, about four inches high, which place in the fire upon a forge, or in a gas furnace, and make red hot. This may soon be done if placed upon the forge, by blowing with the forge bellows : then put the above mixture into the pot, and thoroughly well fuse, stirring it with a thin iron rod. The heat given cannot be too strong, but it must be very carefully watched, and advantage taken of the opportunity for the immersion of the work. When the mixture is properly fused it will begin to assume a brown-yellow flame ; when this yellow flame presents itself, the preparation is quite ready for the reception of the work, which must be suspended in bunches upon fine platinum wire and dipped into the mixture for a few seconds only, when it must be instantly withdrawn and plunged into boiling nitric acid pickle ; if the exact color required is not then produced, another dip, and sometimes a third may be necessary (especially in hollow work), to give the articles a fine rich appearance. The quenching in nitric acid removes any color that may adhere to the work ; but unless it is dried each time between the subsequent dips, the color will fly about. This is caused by the articles being immersed wet, and the scald or burn from the mixture is particularly prominent. The drying out between each dip is not only tedious, but if minute portions of sawdust are left in the interstices of the work, the result of a second immersion would be little black patches upon the surface of the articles, considerably impairing their color. In performing this latter process, it is advisable to wear an old glove to save the hand during manipulation. In coloring in this way it is always imperative that the operation should be quick, whereas in wet-coloring time is required. The gold lost by this method is very trifling, and it is therefore altogether unnecessary to preserve separately the spent coloring mixture and dipping acids ; they may be thrown into the waste water tub, or, if otherwise desired, into the floor sweep. We shall have occasion hereafter to speak of another method of dry-coloring which we have successfully employed, so will, in the next article, proceed to explain the modes of preparing the work.

Revival of Antique Jewelry.

BY ALESSANDRO CASTELLANI.

THE production of jewelry closely imitating the ornaments in gold and precious stones of earlier ages, is now a firmly established industry in Rome. The imitations are so faithful, that each article at once points out the period and nationality of its model.

Italy was in the Early and Middle Ages the most important centre of European civilization and the home of the arts. It is, therefore, natural that we should have selected the productions of the Etruscans, Greeks and Romans as our models. Before proceeding further we wish to say a few words about the Etruscans, to whom we are indebted for the earliest relics of our art. The best informed ethnologists have up to the present time been unable to lift the veil which covers the origin of this people. All we know for certain is, that their cradle was the same as that of other nations, which is proved by the resemblance of their monuments to those found in other parts of the world.

The Remains of Cumæ, the Etruscan Tombs, the Ruins of Nineveh, the Indian Temples, the Pyramids, and other antique Egyptian buildings, all have much in common as regards form, style, and manner of construction, which leads us to the conclusion that these different races have one origin, or are, at least, closely related. The most striking proof of the truth of this assertion exists in the well-preserved gold ornaments which have of late years been discovered in the tombs of Etruria and Greece. There is a great resemblance in form and workmanship between these ornaments—the decorations of the old Indian idols, the valuables discovered in Nineveh by the great arcæologist Mr. Layard, and those Egyptian treasures excavated by A. Mariette, which were so much admired by the visitors of the Egyptian section at the International Exhibition of London. All authorities of the present day agree that the East gave birth to the different nations which spread over Europe.

Our present task, however, is not to speculate on the different causes and accidents which may have occasioned these people to scatter and seek fresh homes in the West, but simply to demonstrate that the objects of ornament produced by the earliest of them, if not altogether the same, have at least a decided resemblance. From this fact we may conclude that they possessed a number of chemical and mechanical processes in common, which are unknown to us.

The most beautiful antique jewelry preserved to our time, both as regards form and workmanship, is that made on Italian soil. Among the races inhabiting Italy in early times were, as we have already stated, the Etruscans, whose history is wrapt in darkness. The historian Miculi (Vol. I., chap. 7 says, "The origin of the Etruscans was very uncertain even in olden times." But their system of religion, of which we have some particulars, their ornaments and household chattels, in fact, everything belonging to them, and which has been preserved to our day, clearly shows that they immigrated to Italy from the East. They are also sure signs that the educated Etruscans cultivated the arts—a pursuit which secures wealth and power to nations. The Greeks, jealous of Rome, called the first Italians barbarians, and pretended that the mythological heroes Hercules and Æneas had introduced Greek civilization into Italy. They asserted that the history and art of the first inhabitants of our peninsula were doomed to perish so as to establish the greatness of Rome and the Latin race. The traditions of these people were, therefore, entirely lost, and their tombs alone, discovered and excavated from time to time, have kept them slightly in remembrance, and show the present generation of Italians the remarkable traces of their forgotten forefathers. Some of the remaining relics display skill and taste of the highest order, inimitable at present; and we are obliged to admit that the arts were in a flourishing condition in those periods. We must not forget to mention that the Greek colonists in Southern Italy, descendants of a race which reached nearer perfection in the arts than any other, left us some ornaments which are nowise inferior to those of the Etruscans. An extended commerce brought a degree of wealth and luxury with it, which they never enjoyed in their native country, and provided them in abundance with the precious metal which they so well knew how to manipulate.

Although more conquerors and lawgivers than artists, the Romans learnt in time to appreciate the tasteful works in gold and jewels of the civilized neighbor they oppressed; and if their productions cannot vie with those of the Etruscans and Greeks, they have still left us some models well worthy of imitation. The barbarism which ruled Europe for several centuries after the fall of the Roman Empire, destroyed the traditions of the art, and made it difficult to assign the correct period to the different articles of use and ornament belonging to antiquity. Recent researches permit us, however, to state that the goldsmith's art was already on the decline in the reign of Augustus. It had attained a high standard of excellence in Rome under the Etruscans and Greeks, but the growth of imperial power was fatal to it. Such has been the case with the arts at all times; they spring forth with the freedom of nations, and begin to wither as soon as liberty suffers or dies out. Works of the Greco-Roman period which are vastly inferior to anything left by the two nations previously mentioned, have been brought to light by the excavations of Pompeii, so that the decadence of our art must have already begun at this epoch.

If a body perishes, it is not only one of its elements that is doomed, but every one that helps to constitute it. So the Roman Empire, falling from one stage of weakness to another, caused the ruin of every class of society and of every branch of art. We can easily distinguish all the works from the third to the sixth century; a time during which rings and bracelets and other objects of ornament were made of great weight and solid form, quantity of material being preferred to artistic workmanship. For this reason we possess comparatively few of these ornaments; they were anxiously sought for by the various barbarian races which invaded and plundered Italy at least a hundred times, and then returned to their mountain and forest homes laden with valuable booty. The first Christians, mostly poor people, which were taught to despise all outward show, had neither the wish nor the means to use costly vessels at their religious ceremonies. Their altars were decorated with terra-cotta and bronzes; and the bread used at holy communion and funeral obsequies was kept in copper cases. The few gold and silver ornaments found in the Roman Catacombs, although similar in form to those of earlier periods, are so inferior in artistic value that they can only be compared to the roughest works of the earliest times. The medallions, rings, and fibulae, which were worn as signs of recognition in times of persecution and danger, were embellished with the symbols of Christianity in the most ordinary manner.

At Byzantium, the new capital of the Empire, which from a Roman gradually became a Greco-Oriental one, the arts underwent a material change. Jewelry lost its antique Italo-Greek type, and assumed the entirely different character of the Arabian and Oriental school; in short, everything became subject to Byzantine taste. Enamels, mosaics, precious stones, pearls, and engraving, all were put together with Asiatic luxury after the characteristic style of the Byzantine school. Still some of the architectural forms of the Greeks were preserved in the general application of ornaments, which help to blend antique and modern art in the period of Renaissance. Byzantine artists, representing, although in half barbarian style, Christian symbols and figures, were obliged to flee from the image-breaking emperors, and settled in Venice. Here they spread the knowledge of their art, which, when adopted by the Italians, gradually drifted into the Italo-Lombardic style. This latter lasted till the time of Cimabue. Many of the productions of this period, such as altars and sacred vessels, still exist in the churches of Upper Italy. After the consternation caused by the prediction of the end of the world, in consequence of a false interpretation of the Scriptures, had subsided, the European nations returned with new vigor to their ordinary occupations, and among others to the study of those arts which help to adorn our earthly existence.

The fine arts were again cultivated, and if they did not attain a state of perfection, their future prospects became at least brighter. Ornaments and vessels for church service had their origin in conventions, where most of them were at first manufactured under the special supervision of the priesthood. Byzantine art, with its distinct forms of antique architecture, is represented by the altars of Cologne and Aix, and many other church relics of this epoch. A capital treatise on the art of decoration and the manipulation of the precious metals was written by Monk Theophilus some years later. About this time the goldsmith's art had made great progress and freed itself more and more of the rough taste with which it was practised during the age of barbarism. In the fifteenth century a new and better Italian school began, creating those *chef-d'œuvres* of our art which remain unsurpassed to the present day. At the head of this school are: Maso Finiguerra, Caradosso, and Benvenuto Cellini. It is not certain whether the Italian masters of the goldsmith's art in the fifteenth century had lost all the traditions of the old school, or if they despised them, and sought to create a new direction for this art—one more in harmony with the forms of the sister arts, which began to revive at this time. As a confirmation of the latter opinion, to which we incline, we quote the following anecdote from the Life of Benvenuto Cellini: He tells us that Pope Paul III. showed him one day a gold Etruscan necklet of exquisite workmanship, which had accidentally been discovered in its hiding place in the earth. He examined it very closely and exclaimed, "It is better not to imitate these Etruscans, as we should only be their humble servants; let us rather strike out a new path, which will at least have the merit of originality." These artists invented and practiced methods which differed entirely from those of their old masters. They made use of graver and chisel; of enamel, nielli, cast ornaments and precious stones; and their best works are those in which these costly materials are combined by the free and original idea of the artist, altogether independent of antique models. With the decadence of Painting Sculpture and Architecture in the time of Michael Angelo, the goldsmith's art also declined. In the seventeenth century the decay was almost complete, and every remnant of good taste was lost under the Spanish and Austrian rule over Italy. It reached its lowest stage towards the end of the last century, and up to the present time our art has, with few exceptions, been deprived of its artistic character, to become the slave of fashion and an article of mercantile speculation.

A few attempts to imitate antique jewelry were made at Naples in the first year of this century. The honor of first reviving our art belongs to the jeweler Sarno; and thanks to the assistance and patronage of Neapolitan archæologists, and a great demand from abroad, it remained in a prosperous condition for a few years; but we cannot assign the real cause of its gradual decrease and its final collapse. Some years later, the artists of this school employed their knowledge in producing counterfeits of the gold ornaments found in Pompeii and Herculaneum. They reached such perfection in this criminal branch of industry that Naples became famous for forged antiquities. With artificial colors, acids and gold solutions, they attained their object so well that any one deficient of great experience in jewelry and knowledge of archæology was unable to decide whether they were really antique or not.

Signor Castellani, the elder, opened an *atélier* in Rome in 1814, for the imitation of French and English ornaments; and it was not long before he succeeded in surpassing them in beauty. This field of labor became, however, too small for him, and in 1826 he applied himself to chemistry with a view of finding some new process for his art, with the assistance of that science. In the same year he was enabled to lecture at the "Academy of the Lincei" in Rome, on chemical processes for the coloring of gold, in which he explained the application of the electric and similar gilding processes. Many scientific reviews spoke highly of his discoveries, among which we shall only mention the *Révue de Genéve*, because it hails from the home of the learned De la Rive, one of the discoverers of the modern galvanoplastic process. By not further prosecuting his inventions the elder Castellani showed what little value he set on outward appearance, which, although it deceives most people, is unable to hide faulty designs and bad taste from the critical eye of the artist.

About this time mother earth returned us some of the wonders and treasures of Etruria, which had been hidden in her lap for so many centuries. Whoever saw them was astonished at the magnificent jewelry found in the old tombs of that mysterious country. Signor Castellani first conceived the idea of copying them. Some admirers of antique art encouraged him in his enterprise; but the only assistance he enjoyed was that of the Duke Michel-Angelo Caetani, who instructed him almost daily, and whom we may call a perfect master in the art of drawing. Years of continued researches and labor enabled Signor Castellani to reproduce the old Italian and Greek ornaments. For this purpose he selected the finest models only, and to his copies he gave the name of "Italian archæological jewelry."

On the discovery of the tomb which now bears the name of Regulini-Galassi, we were invited to examine the beautiful gold works excavated there, and which went afterwards to enrich the Etruscan museum at the Vatican. Such a discovery was of great importance to our art as a means of perfecting our knowledge of old Etruscan jewelry, and facilitating our search after the old methods employed in the working of the precious metals. We also derived great benefit from the later discoveries in Toscrnella by Secondaiano Campana. In all our researches we had the advantage of Duke Caetani's valuable assistance.

A New Metal.

ABOUT thirty years ago R. Hermann announced the discovery of a new metal, ilmenium, accompanying tantalum and niobium in various minerals, and closely allied to them in its general characters. Several years later he relinquished his claims to the discovery, in consequence of researches by Marignac in the same field leading to entirely different results. Later investigations have, however, strengthened his belief in the existence of ilmenium, and in the February number of Kolbe's *Journal für praktische Chemie* he not only brings forward results tending to establish the individual character of ilmenium, but describes a new metal neptunium, belonging to the same group, and occurring in tantalite from Haddam, Connecticut. As the quantities obtained are small, the characteristic reactions limited, and as the spectral properties cannot be made use of, chemists will naturally reserve their opinion till confirmatory observations have been made by some other well known investigator. The following are the essential results obtained by Hermann. The mineral was found to consist of equal portions of columbite ($ROMe_2O_3$ and ferro-ilmenite (RO_2MeO_2). By fusion with potassium bisulphate the hydrates of the metallic oxides were separated out in the following proportions: Ta_2O_3, 32·39; Nb_4O_7, 36·79; Il_4O_7, 24·52; Np_4O_7, 6·30; total, 100.

The hydrates can be changed into double fluorides, and from the greater solubility of potassium-neptunium fluoride, it may be obtained free from tantalum and ilmenium salts, but retaining a small quantity of the niobium salt; these, however, on being changed into niobate and neptunate of sodium, may be separated on account of the greater solubility of the latter. By fusion of the neptunate of sodium with potassium bisulphate and treatment with water, the hydrate of neptunic acid was obtained in a pure condition. Neptunium may be distinguished from niobium and ilmenium by its having, along with tantalum, the property of forming an amorphous insoluble precipitate on the addition of caustic soda to the boiling solution of the fluoride; the other two form crystalline and easily soluble compounds. The very soluble character of neptunium potassium fluoride as compared with the corresponding tantalum salt serves to distinguish it from that metal. The reactions with phosphorus salts in the inner part of the Bunsen flame are the following: tantalic acid, colorless; niobic acid, blue; ilmenic acid, brown; neptunic acid, wine yellow. Addition of tincture of galls to solutions of the sodium salts give characteristically colored precipitates. The atomic weight of neptunium, determined from the double salt $4KFl + Np_2Fl_7.2H_2O$, was found to be 118. Hermann has also obtained ilmenium in the form of a black powder by heating potassium ilmenium fluoride with potassium chloride and potassium.—*Nature.*

Engraving and Chasing.

FROM THE PRACTICAL GOLD-WORKER.

THE art of engraving on stone and metals by incised lines is so ancient that we cannot trace the historic period when it was not practieed; suffice it to say, that among the collections of antique art in the British Museum, there are numerous examples of engraving, the work of the ancient Egyptians and other nations, executed on fine marble and also on precious stones. Besides, we know that engraved stamps or seals were used as official signatures in the very earliest times, for which we have only to refer the reader to the first books of the Holy Scriptures. Again, during the wanderings of the Israelites in the desert, we read that Bezaleel, of the tribe of Judah, and Aholiab, of the tribe of Dan, were set apart specially for the purpose of "devising and executing curious works in gold, silver, and brass, and in cutting of stones to set them, and in carving of wood," for the service of the tabernacle of Moses; and it is also written that God "filled them with wisdom of heart, to work all manner of work of the engraver, and with knowledge of all manner of workmanship of the cunning workman" (Exodus xxxi. 1–6).

The process of engraving is of ancient origin, and is one in which the fine arts and the workman's skill are equally brought into operation. The making of images, some of which existed in the time of Abraham, was a work of great antiquity, though they consisted merely of rude outlines on flat surfaces. This may claim to be the nearest approach to engraving of which we have any knowledge. In the middle ages, *niello* engraving held an important place among metal-workers; it consisted in making fine incisures on works of gold, silver, copper, etc., and filling them with a black enamel, and was called working in *niello*—a process which had a very important effect. This invention is ascribed to a native of Florence, who was deservedly celebrated for his genius and skill in the art, at the period of which we speak—the fifteenth century. To the same artist, whose name was Maso Finiguerra, is given the credit of having employed copper plates for engraving from which impressions were subsequently taken; and he also tried printing from engraved metal plates in this way.

Immediately the discovery became known in Italy, other goldsmiths and artists followed Finiguerra in his new handicraft, and the art of engraving was soon extensively practiced. Throughout the sixteenth century it was considerably improved, and the skill of such artists as Botticelli, Marc Antonio Raimondi, and Benvenuto Cellini, the celebrated Italian goldsmith who was called the prince of gold-workers, did much to raise the fame of the Italian engravers to a high standing, and to bring the art to a greater pitch of public appreciation than it had ever attained before. At first it was usual in Italy, Germany, and elsewhere, for the same person to prepare the design and afterwards engrave it; but afterwards, when the art became more mechanical, the two branches of it were divided; and, strange to say, that method has been somewhat extensively practiced down to the present day.

It would be interesting enough to inquire into the history of the art, and dwell upon the progress that has been made down to our own time; but our present observations being limited, we shall avoid a lengthened description, and come at once to the period of its introduction into England for commercial purposes; this will carry us about one hundred years back; and we wish it to be borne in mind that the engraving of writing was the only branch of the art that had arrived at anything approaching excellence up to that period of time. This is fully proved by numerous specimens of mediæval work to be seen at the present day.

A great and powerful impulse was given in England to the art of wood-engraving by Thomas Bewick, who led the way to that success which has since crowned the efforts of its followers in our own country. To William Hogarth is due the credit of being the founder of the modern English school of painting; but our present mission being unconnected with that art, as such, we shall now proceed to point out its application to the useful arts, especially to gold jewelry. The honor is also given to Hogarth of being the founder of the present school of gold-engravers; but it was left to others to develop the art, and to them is due the present exalted position of the craft—principally to one Draper, a London apprentice, who was long familiarly known as the "father of engravers." One of the great aims of Draper was to make those who were under his tuition more skilful, if possible, than himself, a characteristic rarely found in the modern school of practical goldsmiths; but then we will not say how far the workmen themselves are to blame in the matter.

The trade is much indebted to Draper for improved methods of sharpening the gravers; and various other introductions of his have considerably aided the workman by simplifying the appliances, thus rendering the art more simple and its effects more beautiful.

For more than one hundred years engraving has been more or less practiced for trading purposes in England. Notwithstanding this however, it is by no means common to meet with a first-class workman; for, to reach this point, he must be an artist as well as a mechanic. This is not perhaps imperatively necessary to the ordinary practice of the art; but, as the embellishments produced on works of jewelry by the graver are added for purposes both artistic and ornamental, there is ample scope for the display of a considerable amount of knowledge as well as skill in the execution of his task. It will at once therefore be perceived that the engraver, to become a high-class workman, should not only have a natural ability for design, and a tolerably correct idea of the different periods and styles of ornamentation, but also must be possessed of great taste and judgment, as well as a delicacy of touch and acquired patience, to ensure reputation and success.

The process, or *modus operandi*, of the engraver is as follows:—The workman, for the most part, uses only the ordinary *burin* or lozenge-shaped graver invented by Draper, together with several small gouges and needles for scooping out hollows or making very fine tracery, a sharp-edged scraper similar to a small three-square file sharpened at the point, for removing the burr raised by the graver, and a Turkey-stone upon which he sharpens his tools. He also uses a kind of cement, in which he secures the work previous to its manipulation, consisting of a mixture of Burgundy pitch, plaster-of-Paris, resin, and beeswax in the following proportions:—

Burgundy pitch	4 parts
Resin	4 "
Plaster-of-Paris	2 "
Beeswax	2 "

Place these articles in an earthen pipkin, or other suitable vessel, and melt carefully, stirring the mixture well until thoroughly incorporated; then pour into a vessel of cold water already provided; when the mass is cool enough to touch with the hands, it should be pressed, rolled, and kneaded together, in order to discharge the water contained therein. Should it turn out brittle, return it to the pipkin, and add more beeswax; put it through the same process as before, and work it well together, for the more it is worked the better it will be for use. When the proper degree of elasticity has been obtained, it is then ready for use, and any surplus mixture may be placed aside for a future time. In common engraving a portion of this cement is fixed upon various-sized blocks of wood, to which it strongly adheres by heat. The article to be manipulated upon is affixed to one of these, and embodied in the cement; and when properly set, the block is fastened in the vice, and the engraver performs the task alloted to him.

Best work is engraved in a somewhat different manner. The article is secured to a little stand, which moves upon a ball placed in a leathern socket, and fasted to a handle or other suitable piece of wood; the ball having a double rotatory action, the workman is enabled to bring it into any required position.

Foreign Notes.

A diamond weighing 150 carats has been found in the south side of Kemberley Mine, South Africa.

The venerable Pio Nono has presented the Princess Mercedes, the future Queen of Spain, with a diamond rose of great value.

The old superstition of the death-watch seems to be reviving in England. If it was in America nothing short of a stem-winding death-watch would go down.

Mr. Streeter's book on "Gems and Precious Stones" has gone through three editions. The public evidently accept technical works of this description in good faith.

Victor Emanuel's late morganatic wife, Countess Rosina Miafiori, was a daughter of a wealthy Turin jeweler, named Bellezza. She was a great beauty in her youth.

The Swiss watch manufacturers will have their revenge at the Paris Exposition. Their display of watches is estimated at two millions of francs, and all the best known manufacturers will be represented.

The Ex-Empress Eugenie has sent to the young bride of the King of Spain a magnificent *parure* of sapphires and pearls; also a branch of fern encrusted with diamonds, and a cluster of flowers and fruit in the natural tints, composed of precious stones.

Ex-Queen Isabella, of Spain, being in want of ready money, has parted with a necklace valued at $60,000. It contains 169 pearls of the largest size, and the clasp is a sapphire of marvelous brilliancy, surrounded by forty diamonds of the purest water.

Sir John Bennett, the London clockmaker, is giving lectures on watch and clock making, and has no difficulty in getting an audience to hear him. The success of the Waltham watch in England has puzzled the British makers much more than they care to admit.

A London jeweler has recently introduced a new material called "Neapoline," a very good imitation of coral. It is presumably of the nature of American celluloid, although the inventor claims that the material is not identical with that substance.

A petition addressed to the Minister of Commerce and Agriculture, having for its object the nomination of the jury connected with the horological section of the Paris Exposition, has been signed by over two hundred of the contributors, principally residents of Paris and Besancon. The petitioners point to the fact that the amount of technical knowledge necessary to decide on the merits of the various articles to be exhibited, from a chronometer to a public clock, renders it impossible for any but practical men and experts to make a satisfactory award. The petitioners desire the Minister to authorize them to designate, by the majority of their votes, the French members of the Jury of Awards.

The artificial production of rubies and sapphires in France is regarded as highly successful. The process consists chiefly in heating to redness, for twenty days, a mixture of plumbic aluminate with silica; the alumina crystalizes out in the form of corondum. The addition of potassic bichromate to the mixture turns the corondum to ruby; of cobalt oxide to sapphire. The artificial gems meet every test which can be applied to the natural ones, and though rather small are large enough to be cut and set as jewels. The recent reduction of oxygen, nitrogen and hydrogen to liquids has started the suggestion that in this shape they may prove powerful solvents, in which case a new line of research will be opened that might, perhaps, lead to the manufacture of diamonds.

A gilt silver vase or goblet of the middle of the sixteenth century, and of exquisite workmanship, has been brought to England from Holland lately. The lid is ornamented with six heads in *repoussé* of the kings of the Lancaster and York families, Henry IV., Henry V., and Henry VI., Edward IV., Edward V., and Richard III. Around the foot of this vase are engraved the words, "In remembrance of my dear father Count Lenox, by his grateful son Count Darnley, King of Scotland, and Mary, Queen of Scotland, 1564." According to the French architect and antiquary, M. Viollet-le-Duc, this object, which stands about two feet high, is perfectly authentic, and was manufactured either in Louvain or Mechlin about the middle of the sixteenth century. It must have been presented by the King and Queen of Scotland on the occasion of a ceremony.

Paris is crazy over a new toy. It is a two-penny card bearing a picture of a family on moving day. They are passing by a tree and their cat has escaped. "Where is the cat?" is the question, and after the purchaser has vainly puzzled to find anything resembling a cat in the picture the vendor holds it in a certain gosition, and lo! there is the missing cat filling the whole foliage of the tree. On New Year's Day the boulevards were literally crowded with people hunting for the cat.

A dealer in Paris offers for sale the tenth Mazarin diamond. Few people know that there were originally twelve large diamonds, weighing sixteen carats, and called the twelve Mazarins, because that acute Cardinal was instrumental in having them cut according to a system invented by Berquin. They all suddenly disappeared, being either stolen or lost, all with the exception of one said to be worth 50,000 francs. The tenth Mazarin was of square shape and rounded on the top; but it is supposed to be safe in the collection it was bought from, and therefore the authenticity of the new pretender is contestable.

At the Paris Exposition the exhibition of minerals by California will be exceptionally fine. Their estimated weight is five hundred tons. A pyramid twenty feet square at the base and nearly seventy feet high will represent the seven millions of cubic inches of gold which have been produced on the Pacific coast. This mass would be equivalent to a solid piece of gold as large as a room sixteen feet square and very nearly sixteen feet in height. Around this pyramid fifty plate-glass show cases will be arranged, in which the mineral wealth of the country will be shown "Life under ground" on the Comstock lode will be exhibited by diagrams, and the Sutro tunnel will be fully represented.

Fire and precious opals are profusely met with in Mexico; the former in the districts of Zimapan, Esperanza, and others; the latter only in those of Esperanza, Amealeo, and Real del Monte. A specimen of precious opal sent by the Mining School of Mexico to the Philadelphia Exhibition had a charming variety of colors, and it was embedded in a mass of siliciferous porphyry, which contained a large quantity of nodules, formed by opals or by strata resembling onyx. The principal varities of opals found in Esperanza are the Mexican, Hungarian, "Gerasol," Milky, and Harlequin. The Mexican variety is notorious for its emerald-green and copper-red tints.

Among the recent acquisitions of the British Museum is a small series of very beautiful gold ornaments found together in a tomb at Cyme, in Æolis. The series includes two pairs of splendid earrings formed of large discs, ornamented with filigree work, from which are suspended by fine chains inverted pyramids, also covered with filigree work, and in some parts with enamel. Between the disc and the pyramid is a kneeling female figure, draped. One of the necklaces is very elaborately enriched with filigree work. With these ornaments was found a gold statue of Alexander the Great, which naturally determines the date of the jewelry as not before his time, a result which would also be arrived at from what is already known of the characteristics of Greek jewelry. It cannot well be long after his time, and in all probability is contemporary with him.

"*Vous avez beau dire; je n'ai trouvé nulle part en France cet esprit dont vous parlez*," said an old Prussian General to Princess Metternich, who is noted for her love for France. "What, no *esprit*!" retorted the Princess. "Give what you will to French people, and I wager they will make of it something pretty elegant and witty." "Well, Princess," said the general, with scornful complacency, "here is a white hair I find on my uniform, I give it to you *carte blanche*; send it to Paris, where, for my part, I found only among the men *de l'esprit de coiffeur*, and among the women *de la grace de cuisiniere*." Princess Metternich forwarded the white hair to a Paris jeweler, ordering him to make with it some striking piece of jewelry. To the order she added this postscriptum, "*C'est pour faire une nich a un Prussien*." A week afterward she received an *écrin*, which she presented to the General, saying ironically, "Pray to God that your hair may not break." It contained a massive gold necklet, with a *médaillon*, on which were enameled the arms of Prussia; to the *médaillon* were suspended by the white hair two smaller lockets in black enamel, on which were inscribed in tricolor letters formed with rubies, sapphires and diamonds, these words, "Lorraine-Alsace."

Trade Gossip.

Odd coins are the most fashionable bangles.

An odd setting in a finger ring is in the shape of a tiny mouse.

Amber viniagrettes are the latest useful trinket for tickling noses.

The newest fob chains have leather links combined with those of gold.

G. Tagliabue, the well-known thermometer manufacturer, is dangerously ill.

The newest shell brooches are a hand grasping a bird with widespread wings.

The newest fob-chains are composed of gold links and stars arranged alternately.

A. Goldstein & Co., of Washington, D. C., have been slaughtering their stock at auction.

Trade throughout the country is being paralyzed by dealers sacrificing goods at auction.

Among new ornaments in silver and gold filagree are large gadflies with jewels for eyes.

The authorities of Charleston, S. C., impose a license of $100 on all travelers selling from samples.

Jeweled thimbles are much worn. Those studded with pearls and turquoises are the most fashionable.

A fifteen-carat diamond, said to be the first discovered in the State, has been found in Wabash County, Indiana.

The increased orders from the South for firearms indicate that that region is again beset with peddlers of cheap jewelry.

Jewelers state that a marvelous quantity of old-fashioned trinkets were exchanged in part payment for gifts of jewelry these holidays.

Burglars entered Joseph Steers' jewelry store, at 549 Seventh Ave., on Monday evening, January 21st, and stole a quantity of rings, chains, and pins.

Cable & Lounsbury, manufacturers of gold rings, have dissolved partnership. Mr. A. Lounsbury continues the business at 103 Fulton Street, N. Y.

L. Hammel & Co. have bought out the interest of their silent partners, Freund, Goldsmith & Co. The business will be conducted as heretofore.

The Castellani collection, now on exhibition at the Metropolitan Museum of Art, is about to be sent to Paris, to be exhibited at the coming Exposition.

It is reported that Mr. Banks, formerly of the firm of J. E. Caldwell & Co., will form a co-partnership with the successors of Robbins, Beddle & Co., Philadelphia.

L. Langes, a diamond broker doing business at 463 Broadway, has been arrested on a charge of receiving stolen goods, and held in $2,000 for examination.

Living fifty-four years in one village, and during that time repairing 18,000 watches, for each of which he received pay, is the history of a jeweler of Sandy Hill, N. C.

A traveler for a jewelry firm in this city, when on the road, drums up trade during the day, and warbles a few plaintive notes at eventide in a traveling opera troupe. "Tenor C" is his stronghold.

"God helps the man that helps himself, but God help the man caught helping himself here," is a notice posted behind the counter of a silversmith's in Boston. A double-barrelled gun hangs near the notice.

It turns out that about half the male citizens of Minneapolis have paid $3 apiece for membership in a "Government detective force," organized by a chap who came to town with bogus certificates, collected his money, and then lit out.

The Elgin National Watch Company signal the new year by a new departure in their base of operations in this city, and have removed their place of business from No. 1 Maiden Lane to the apartments formerly occupied by the late firm of Starr & Marcus, No. 22 John Street, which have been fitted up for their occupation.

A bill has been introduced in the Ohio Legislature to compel traveling men representing non-resident business houses to take State license, under penalty of $50 for failure to comply with the law, nine-tenths of the penalty to go into the school fund and one-tenth to the informer.

Robert Wilson and J. W. Cusack, manufacturing jewelers, who occupied apartments in the *Times* building at Troy, N. Y., had their stock destroyed in the burning of that establishment.

Sixty thousand commercial travelers are employed by the wholesale merchants of the United States, at an average annual expense of $3,000 at least, making the aggregate the enormous sum of $180,000,000.

Diamond digging in South Africa has now settled down into a paid industry. Companies have been formed, dividends are declared monthly when there are any, and there is something like a fixed trade of findings from this claim or that.

A Parisian novelty in bracelets consists of gold and silver serpents, which are twisted as many as eleven times around the arm. Serpent designs are very much used for all articles of jewelry. Handsome pins are again in use to fasten coiffures and bonnets.

There was a man who had a clock—his name was Matthew Mears, he wound it regular every night for nearly twenty years. At last his precious timepiece proved an eight-day clock to be, and a madder man than Mr. Mears you would not wish to see.

Oscar A. Numinger, a resident of Newark, N. J., has been taken to Denver, Col., to answer a charge of having sold to Young & Everett of that city a quantity of largely alloyed gold, he being an assessor there at the time, and representing the stuff as pure.

The finest jewelry is no longer made up in single sets of diamonds pearls or turquoise, but in combinations of color—diamonds with turquoise and pearls, opals with rubies and diamonds, diamonds with emeralds, and rubies and sapphires with diamonds and gold.

Aiken, Lambert & Co. have, in consequence of increasing business, found it necessary to seek more commodious quarters. They have, therefore, leased the store No. 23 Maiden Lane, formerly occupied by Alex. M. Hays & Co., where they will shortly move.

Frank S. Gorton, late of the firm of E. Bessenger & Co., has been admitted to membership in the well-known house of Baldwin, Sexton & Peterson. We congratulate Mr. Gorton on his good fortune, and trust that the co-partnership may be a happy and prosperous one.

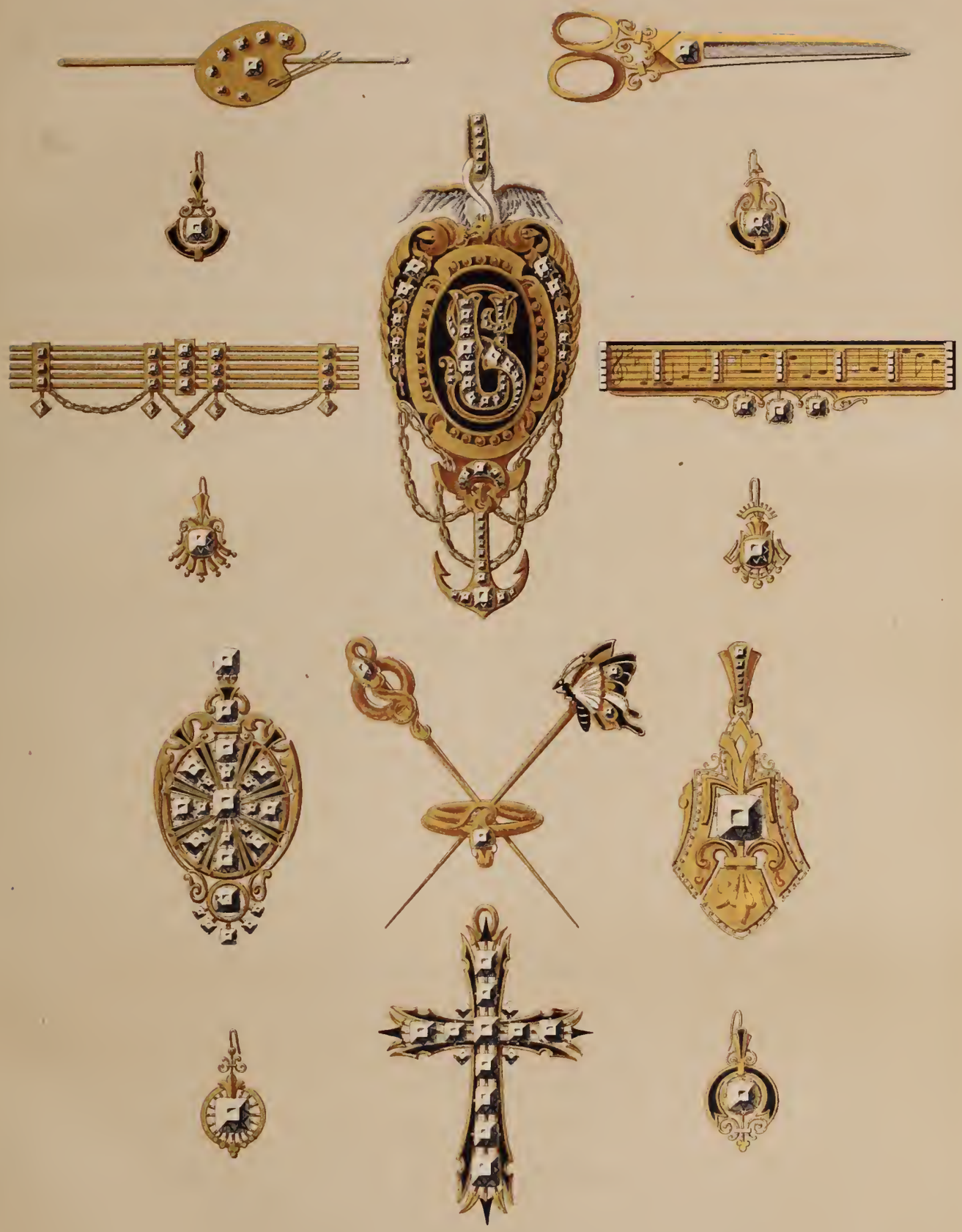
A chronometer, with the following card, was picked up at the beach near Cape Hatteras on the 1st inst.: Chronometer, No. 66 on the top, and 47,408 under a line; made by Joseph Johnson. It is this day fast of Greenwich time seven seconds, and is gaining five seconds daily. Marked New York, John Oakes, No. 140 Maiden Lane.

Messrs. Alex. M. Hays & Co. have secured the building corner of 16th Street and Union Square, formerly occupied for banking purposes. The store is being thoroughly renovated, and will be fitted up with every requisite for the display of goods and convenience of buyers. This firm will occupy the premises about May 1st, and will open with an attractive line of rich fancy goods, bronzes, etc.

A new bracelet, outwardly of a most chaste, innocent and beautiful design, but inwardly a ravening wolf, has just been invented and thrown on the market. It has a wicked little secret spring that reaches out and nips a fellow by the cuff the moment he touches it, and holds him there until "pa" can come into the parlor, and gazing sternly upon the affectionate and perturbed tableau, demand of the young man what are his intentions.

A young man firmly held the knobs of the door of Julius Bendix's jewelry store, at 792 Third Avenue, on Feb. 1, while a confederate, James Connolly, alias Lawrence, broke the show window, and stole a tray containing $312 worth of articles. A few blocks from the store Connolly stumbled over a snow heap, and the tray fell into the gutter. He was immediately arrested by an officer, and a few days ago was sentenced in the Court of General Sessions to State Prison for four years.

Thomas Kirkpatrick, jeweler, of No. 889 Broadway, has for some time past missed diamonds from his shop, ranging in value from $50 to $200. The peculations have been kept up for nearly six months, but every effort of Mr. Kirkpatrick to discover the thief proved ineffectual. Two or three rings were recently robbed of their diamonds and the settings returned to their places in the case, and this circumstance led Mr. Fitzpatrick to suspect the bookkeeper, Edwin T. Arthur, who was accordingly arrested by the detective detached to watch his movements. Arthur confessed to the theft of the diamonds. It was the old story of extravagance, temptation and embezzlement. The diamonds were sold to J. R. Clute, a diamond broker of 1 Park Row. The accused is held for trial.



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The Paris Exposition.

THE full list of American exhibitors at the Paris Exhibition has been published, and we are now informed of those who have applied for space, and to whom allotments have been made. America will be represented by almost six hundred exhibitors, of which only fifteen belong to the jewelry trade. It is much to be regretted that more of the jewelers of America have not seen their way to support the national honor by participating in the forthcoming Exposition at Paris. The experience of Philadelphia has proved that America has advanced beyond the expectations of all; and competition at Paris would have strengthened the good impression already formed at the Centennial Exhibition, and at the same time give the American exhibitors much valuable information.

The exhibitors include the American Watch Co., watches and watch movements; Ansonia Clock Co., clocks; Aikin, Lambert & Co., gold pens, pencil cases, etc.; H. F. Barrows & Co., plated jewelry; Bausch & Lomb, optical instruments; Bliss Bros. & Everett, Attleboro, Mass., plated jewelry; Leroy W. Fairchild & Co., gold pens, pencils, cases, etc.; Wm. C. Greene & Co., Providence, R. I., jewelry; Hagstoz & Thorpe, Philadelphia, watch cases and pliers; P. Hartmann, silver filigree jewelry; F. Kroeber, clocks, L. P. Juvet, Glenn's Falls, Time Globe; H. Muhr's Sons, Philadelphia, jewelry and rings; F. J. Marcy, Providence, R. I., jewelry; Wm. F. Nye, New Bedford, Mass., chronometer oil; Tiffany & Co., silverware and jewelry; Weston Dynamo-Electric Machine Co., Newark, N. J., electro-plating apparatus; F. G. Whitney & Co., North Attleboro, Mass., jewelry; Young & Bennett, North Attleboro, Mass., jewelry.

This list is very short, and while it contains some names well-known in the trade and who will make good displays, it does not represent properly or fully the jewelry and kindred interests of this country. We have amongst us silver workers and plate manufacturers whose wares have been received with acceptation in the European markets, and we hear on good authority that they are well able to compete with manufacturers abroad. These firms should have been represented at the Paris Exposition, for in this country, where so much silver is produced, manufacturers should find a fitting home, and we should be large exporters of plate and silver ware. As it is, much raw material, either in ore or bar, is sent to England to be worked up. We have better facilities of manufacture. Our goods have already won a footing on the other side of the Atlantic, and, if the market had been well pushed, we should have effected a marked and lasting progress. We are also astonished that American clock-making interests will not be better represented. This is a national industry which has become world-famous. Go where you will throughout the world you meet American clocks, and yet in this line, our representation does not include many of our best known, and largest firms. On the other hand, we have reason to rejoice that such firms as those mentioned above have had the enterprise and spirit to come to the front; and from the character which they already bear, there can be no doubt that they will do great credit to the branches of industry which they represent. Such firms as the American Watch Company and the Ansonia Clock Company are an honor to the country. Messrs. Aikin, Lambert & Co., and Leroy W. Farchild & Co., are foremost in their line of trade, while the Messrs. Barrows have proved themselves men of ability and enterprise, and Mr. Hartmann has naturalized an industry in this country, and actually improved upon the choicest work of China, Geneva and Spain. It is needless for us to refer to Messrs. Tiffany & Company. This firm will doubtless present a superb display, such as that which marked their appearance at the Centennial. Messrs. Muhr's Sons, of Philadelphia are also recognized as a competent and leading firm in their specialties. Hagstoz & Thorpe will make an interesting exhibit of their patents, while F. Kroeber will display novelties in clocks and Mr. Juvet's "Time Globe," will interest scientists, as well as the Weston Dynamo Electro Plating Machine, while the provincial manufacturing firms will find good exponents in William C. Greene & Co., and F. J. Marcy of Providence, and F. G. Whitney & Co., and Young & Bennett, of North Attleboro,, and Mr. Nye's exhibit of chronometer oil will challenge the competition of the world.

We cannot hope that any more American jewelers will go to Paris; but we do urge upon those who are going the necessity of supporting the reputation already earned at the Centennial by persistent effort and generous outlay. The American exhibits will be carefully regarded and scrutinized, and it behooves each and every exhibitor to do his very best, in his own interest and in the interest of his country, to make the representation of America such that the respect already compelled shall be increased and fortified. The time has come when Americans should be exporters instead of importers, and those firms who exert themselves at Paris will reap the benefit of the first change in the tide of trade.

The Retail Trade.

ONCE a month every one of our readers hears from us, and we have a good deal to say to them. In return, we would like to hear a little oftener from our readers. As it is, letters are frequent from our subscribers, either giving us information of what is going on or hints as to what will be desirable for the trade to know. Very often we receive kind, pleasant notes of commendation, and, occasionally, some one who thinks he has been aggrieved wants to know the reason why, or points out wherein we have been misinformed.

But we desire to have a fuller and further expression of public opinion upon matters pertinent to trade interests. This paper is

published for the benefit of the retailers, and it has ever been our object to protect the honest trade of the country against illegitimate innovations and outside attacks calculated to work it infinite detriment. Whenever such have come to our knowledge we have not hesitated to publish them to the world, but in this good work it is necessary that our hands should be strengthened by the trade at large, for it is only by combination that such evils can be obviated. We desire to place ourselves in closer communication with the retail trade of the country, and to that end we ask for voices from the people telling us of the first and earliest indications of any of those evils so prevalent at present, which are calculated to divert legitimate trade into outside channels. By giving us this information, the dealers will protect themselves and the community. It is needless for us to recapitulate the arguments we have so often published in relation to the invasion of the jewelry trade by dry-goods houses and the giving of watches as publication premiums. This thing must be put an end to, and careful thought has convinced us that the best and surest method will be for each and all of our subscribers to do their part, thus enabling us to do ours. We want facts fearlessly expressed, and hope that by such correspondence as we have solicited we and our readers will become better acquainted, and that both may profit by our mutual knowledge in more ways than one.

There was a falling off in the February failures as compared with those of the month of January. Sixty-seven were reported for last month against one hundred and twenty-nine for the preceding one. The liabilities declined from $7,113,000 in January, to $2,658,598 for February. This seems to indicate a healthier condition of the mercantile and commercial world. For three years there has been a steady sweeping away of rotten and insolvent firms, and it looks now as though the cleaning was about complete.

A meeting of the diamond importers was recently held in this city to discuss the proposed reduction in diamonds advocated by the new tariff. At present a ten per cent. ad valorem duty is levied, and it is proposed to reduce this one-half. Many of our leading merchants are of opinion that this course of action will not conduce to the best interests of the trade, and considerable difference of opinion was manifested at the meeting. After a long and elaborate discussion of the points raised on both sides of the question, the meeting, which was pretty evenly divided, adjourned without taking any definite action in the matter.

We present our readers in the current number with a handsome plate designed by Mons. Jeanne, illustrating the latest ideas in fine diamond-setting. Some of these patterns will be found to be quite new, and we would direct special attention to the combinations for solitaire earrings, in which black enamel is worked in in various forms, so as to produce very effective results. The pendant in the center with monogram is also well worthy of examination as being a thoroughly artistic and finished piece of work. Our out of town readers will thus be able to see what is going on in the city as well as if they had come on and inspected the choicest stocks.

Imposing demonstrations against any proposed change in the tariff are being held throughout the country, and have wrought such an effect on certain members of Congress that it is said a proposition is under consideration (similar to that of the whiskey and tobacco tax) to offer a resolution declaring it inexpedient to make any change in the tariff laws this session. This would certainly be a wise move, and if it is done would be creditable to Congress. For their own reputation the majority which now controls Congress should see that nothing more be done this session that will in any way help to complicate and cripple the business interests of the nation.

Two of the oldest and best known of the jewelry manufacturing firms of Philadelphia have consolidated, and hereafter the new firm of Simons Brothers & Co., will include the members of the old firms of Speicker, Simons & Bro. The business of the new house will be conducted at the old stand of Simons' Brothers & Co., on Sansom street, where all the specialties of the old firm will be offered to the trade with increased facilities of manufacture. In the manufacture of gold headed canes and gold thimbles, the Messrs. Simons, have an established reputation extending over nearly a half-century, and their latest novelty of "tinted jewelry" shows the enterprise and energy of the present firm. The patterns are very beautiful, and the taste and finish displayed in the completed article should render them very saleable—may the new house live long and prosper.

A meeting of the manufacturing jewelers of this city was held at the St. Nicholas Hotel on Thursday, the 23d of February, to consider the proposed revision of the tariff, now before Congress, which provides that "Section 394. Precious stones and jewelry, diamonds, cameos, mosaics, gems, pearls, rubies, and all other precious stones, and all imitations thereof, whether set or not set, and all other jewelry of every description, including beads and bead ornaments not otherwise herein provided for," should be hereafter admitted at 5 per cent. *ad valorem*, being a reduction from the present rate of 25 per cent. The meeting was attended by representatives of the leading manufacturing firms, and, after considerable discussion, a committee was appointed to submit a remonstrance to Congress, on the ground that the condition of domestic trade does not justify such action, nor would it be for the best interests of the country to cut down the tariff to such an extent.

Commercial agencies are an institution of this century, and, without doubt, give much valuable information, and are preventive of much fraud and crime. The reports which are furnished by leading and reliable firms benefit both the manufacturer and the honest retailer, while they prevent scamps from getting credit. We are sorry, however, to note a disposition on the part of some publlshers to print the misfortunes of retailers for the public perusal. This information is derived from stale commercial reports, and it is neither pleasant nor advantageous that such things should be blazoned forth to the world. Such matters chiefly concern the wholesale trade, which is promptly and fully informed through the legitimate channels of trade organizations; and this intelligence is not intended for gratuitous distribution, the only effect of which will be to further weaken the standing of the person reported on, and generally to demoralize trade. Commercial agencies have their regular subscribers, to whom they supply information on demand. Newspapers have no business to infringe upon their province, and publish private views to the world at large.

A committee of eminent merchants of this city has been appointed by the Chamber of Commerce to thoroughly investigate the present bankruptcy law, and report what rights, if any, creditors have under its provisions. As the law now stands, the creditor is obliged to compromise on the basis offered by the debtor, or go into court with the calm consciousness that whatever the debtor has not made away with will be gobbled up by the lawyers. The present discontent with the working of the law is no new thing, but it is only of late that a hearty disapprobation of its principal features has been distinctly manifested. The business difficulties of the past few years have thrown so much business into the bankruptcy courts that the evils of this system have become manifest, and now those who have most at stake are determined to know the reason why they are being plundered, and see if some remedy cannot be devised to prevent the wholesale robbery to which they are subjected. As things are, creditors have no rights which debtors are bound to respect, and the sooner something is done to protect the crediting class and his honest customer from the thievery of fraudulent bankrupts, the better it will be for the country at large.

Proceedings of the Horological Club.

A Distinguished Body of Watch and Clock Makers.

Forty-eighth Discussion.—Communicated by the Secretary.

THE Chairman, after calling the distinguished body to order, stated that he experienced great pleasure in noticing the interest felt in our proceedings by the trade. A large number of letters had been received, containing questions or information, or suggesting some subject for our consideration. It would therefore be necessary for the members to restrain the flow of eloquence in commenting upon the different communications, in order that we might get through with them all if possible. Promptness in attending to our correspondents was not only due them in courtesy, but requisite to insure a continuance of their favors. He also advised that, at this meeting at least, comments be entirely omitted upon such letters as did not require decided disapproval or explanation before going to the public—leaving them to our readers to think over for themselves.

He desired it understood that all communications intended for us should reach New York not later than the last week of the month, in order to be laid before the Club and reported in the Circular for the following month. The ideas should be fully and clearly stated, but as briefly as possible, written only on one side of the paper, addressed to the Secretary of the Horological Club, and mailed to D. H. Hopkinson, Esq., who will transmit them to the Secretary in time for the next ensuing meeting of the Club.

The first communication was from our always welcome and respected correspondent, "Excelsior," who wished space in our Reports for his answers to two letters, thinking that if thus published they might be of interest to others besides the writers of the letters, which, with his answers, are as follows:

"Excelsior's" method of enlarging measurements.—Drawing the detached lever escape wheel.—Mr. Isochronal appointed as "Excelsior's" representative.

D. H. Hopkinson, Esq.,

Dear Sir:—I have been looking forward to Excelsior's article on the chronometer escapement with a great deal of interest. In the last number of the Circular I see his first article on the above escapement, and think it opens very favorably.

I have received the last English *Horological Journal*, in which there is a lecture on the chronometer escapement, given to apprentices, by Mr. Nelson. In my humble opinion a greater muddle of unintelligent hash could not well be imagined. He says: "If, therefore, you wish to obtain a perfect knowledge of the chronometer escapement you must proceed to draw off the escapement on geometrical principles." Why the devil, then, don't he stick to his text and proceed to show the apprentice how to draw off and develop the escapement according to measurements and geometrical principles?

What use is there in instructing the apprentice how to work from models, "making the impulse roller half the size of wheel"? "You next form the crescent in pallet roller to allow the wheel to act freely. See that you give space enough * * * ." I would ask how much? 40°, 50°, 80°, or 150°? Who knows what he meant? "Put the pinion and staff in the frame and mark the plate behind the second tooth from the roller." What for? Of course I know, and presume that every intelligent and experienced watchmaker knows; but is it presumable that the apprentice knows?

I point out a few of the thumb rules given by Mr. Nelson, and there are many others in his lecture given to apprentices, on making and planting the chronometer escapement on geometrical and scientific principles. I hope Mr. "Excelsior" will notice these faults in his articles, and give clear and concise reasons, whys and wherefores, in measurements and truly scientific as well geometrical principles, so that any apprentice, as well as older brethern of the craft, not familiar with the true principles of the escapement, cannot fail to understand the explanations and instructions.

The *little* manifestations are the very things that the practical workmen most need. "Excelsior" says: "Increase the distance between balance and wheel center ten times, for securing clearness in the drawings, by *pricking off the center distance ten times* on a fine straight line drawn in ink on smooth paper." Why not give this distance in millimeters and fractions of millimeters, and then increase the distance ten times, by calculation, which would give the actual magnitude at once, and much more accurately for the development of the parts; and after making the drawing simply reduce it by dividing by ten, which would give the actual working size?

I only speak of these points for his consideration, thinking them wothy of notice. Hoping the fact of calling his attention to the importance of the above facts may be received with the same friendly spirit as that in which they are suggested, I remain, etc., E. B. N.

Mr. E. B. N. is theoretically right, but practically wrong. If we were measuring a balance staff with one of Grossmann's gauges, which showed its diameter in millimetres and fractions thereof, it would be the best way to enlarge it by calculation, as he states. But he forgets that center-distances cannot be measured with such a gauge, but with a depthing tool or pump dividers. The distance being found by careful measurement, and observing the precautions stated for keeping the tool perfectly vertical while measuring, my way to enlarge that distance is, to first get the same amount of projection to the two points of the tool if not already so, then prick it off ten times on a fine straight line. His way is to measure the distance between the points on a millimeter gauge, increase it ten times, by calculation, then transfer that distance from a graduated scale to the paper. Now, if the points of my tool are fine, and properly tapered, I venture to say that in nine cases out of ten my enlarged center-distance will be more accurate than his, and in the remaining case it will be equally as close as his.

Every time a measurement is transferred, whether from a tool to a scale or the reverse, or from one tool to another, there is almost a certainty of a slight error, which will be more or less, depending on the care and skill of the workman, and the perfection of his apparatus. In my method the measurement itself, without alteration, is laid off ten times on the line, the first prick being one end, and the last one being the other, which can then be measured—there being but one error. By his method the center-distance is first transferred to a metrical gauge or scale, which gives one error. This error along with the distance is then multiplied ten times, and that amount transferred from a scale to the paper or to the drawing tool, which gives another error—in all, eleven errors.

In practice the error may or may not be as great as that, but the probability of correctness is on the side of the pricking process if properly carried out. The line should be fine, the points should be placed exactly upon it, not pressed into the paper, but bearing on each one just enough to prevent its slipping while the other is brought around and planted on the line in front of it—the tool not being lifted from the paper till the last prick, which is a little deeper than the rest, for holding the point of the drawing tool, and is marked by a light scratch sideways, or a pencil mark, just as a carpenter marks his awl pricks. With good tools, carefully used, the pricking process is not a mere makeshift, as Mr. N. may have thought, but will bear comparison with any other, in the above style of operations. I have been thus full in my explanations, in order to convince readers that my directions are not written carelessly or without good reason. It is quite possible, in the multitude of points to be treated, that I may occasionally overlook one. But if any directions given appear to be mistakes, a more careful reading and study, or an exact trial, will probably show them practically correct.

In reducing the enlarged measurements to actual sizes, they are divided by ten, and the points of the tool carefully set to that amount. But even here the pricking process is capable of testing the accuracy of the reduction, as any error in the setting would be repeated ten times, and so become a perceptible quantity. A millimeter gauge and scale are very important aids to accuracy in measurement. The metric system, having finer divisions than the inch system, and capable of almost unlimited subdivisions, is both an assistant and an incentive to perfection in workmanship. Every one striving to do his best should possess such tools. But as there are probably not fifty workmen in the country who have them, I have not confined my articles to that system, but given the principles, and left each one to use such scales as he might have.

Will "Excelsior" please explain the method to draw the inclination of club tooth in detached lever escape wheel (section 347) more fully? I have compared the designs, and find that the space between circle *a* and *y* is larger, consequently a larger angle, if I am not mistaken. E. P.

If Mr. P. will read the directions carefully, giving every word due weight, he will find the process fully and correctly stated. But if, in any case, the directions in the text of the "Hints" do not correspond with the figures in the engraving, the former should be followed. Even if the original drawings were perfect, the engraver may not follow them precisely, either from accident, or not understanding what was meant to be represented, and cutting the lines according to what he supposed to have been intended.

Now, I have a favor to ask. As my time is too much occupied to permit of answering the numerous inquiries made, and which can generally as well be answered by any thoroughly informed workman as by myself, I would consider it a kindness if Mr. Isochronal would consent to act as my proxy, and allow me hereafter to turn over to him such letters as do not require my personal attention, to be answered by him in the Club. His views on most points agree pretty well with mine, and his ability is undoubted, so that he will unquestionably represent me to the full satisfaction of inquirers, some of whom I should otherwise be compelled, from want of time, to neglect. EXCELSIOR.

Mr. Isochronal accepted the highly complimentary commission with thanks for "Excelsior's" good opinion, and would endeavor to fill the position acceptably to him as well as to his correspondents.

HEATING WATCHMAKERS' SHOPS.

Secretary of the Horological Club:

I notice that several mention that there is a difference of 10° or more in temperature at the top of their Regulator case than at the bottom. Now if this is a fact, occurring to those who mention it, I wonder they have not remedied the evil long ago. How any one can work with his feet in an ice box and his head in an oven is a wonder to me. To remedy the trouble a rapid and thorough circulation of the air in the room is required. In my house (heated with a furnace) it is accomplished by having a cold air flue from the back end of the front hall, to connect with the cold air flue from outdoors where it enters the bottom of the furnace. I have only four registers in my house, all on the lower floor, and there is very seldom over two or three degrees difference in the temperature of the chambers and the lower rooms, or on the floor or at the ceilings of any room. The principle is to freely circulate through the house a large quantity of moderately warm air, and all parts will be comfortable. To do this in a shop it might be necessary to enclose the stove in a drum or small room, open for about eight inches at the bottom, and twelve to fifteen inches at the top. This would rapidly circulate the air in the room, without making a draft, and it would soon be of one uniform temperature all through the room. This I throw out simply as an illustration of what is needed, and experience has proved it very much more comfortable than the usual method of warming rooms. L. F. M.

ANOTHER PILL FOR THE BOTCHES.

Secretary Horological Club:

At repeated times plans were published, as suggested, in regard to ousting botches, but seeing that no satisfactory result has been reached as yet, and you are willing to receive more suggestions, allow me to express my ideas on that subject. As it will be impossible to send all the botches to State penitentiaries to learn their trade better, we should, by all honorable and available means try to check the confidence which botches do enjoy, to some extent, either on account of being good talkers, or because their charges are in some instances a few cents less than those of a learned watchmaker. To reach that purpose best I would propose to form a "National Watchmakers' Union," and it to proceed from New York. Re-baptize your Club under this name, and invite, by circulars, all the watchmakers of the country to send in their petitions for membership. Such petition must state the name in full of the petitioner, the length of time he served as an apprentice, under whose guidance he worked then, and where; also he is to give two watchmakers as reference. The petition to lie over a sufficient length of time (say three months) to make inquiry in regard to petitioner. If found worthy, he is to pay a certain sum (say $5.00) sufficient to pay all expenses and trouble such petition may incur, on paying the same a handsomely printed diploma to be handed or forwarded to him. Such diploma shall state that only by his merits as a competent watchmaker he gained admittance into this "National Watchmakers' Union," or such terms of expression as the Executive Board of such Union may find proper. A diploma like this can be handsomely framed, and a conspicuous place assigned to it in any workshop or store. It will not be difficult for those who receive such diplomas to have favorable mention made of it in their respective local papers. By these means a botch may be left out in the cold. The pride and honor of a good workman will not permit him to recommend botches, nor to withhold advantages from his equals.

Something ought to be done for the protection of good workmen, and against botches who prove to be a curse to our trade. J. S.

The members generally thought the idea of Mr. S. a good one, but some feared that personal feelings or business jealousy among rival watchmakers would prevent it being entirely satisfactory in practice, although it certainly ought to, and doubtless would, if watchmakers were all that they should be.

HARD SOLDERING STONE SET RINGS.

Secretary of Horological Club:

Will some member of the Horological Club inform us whether it is usual to remove stones in set rings, pins, etc., during firing; and, if not, state the simplest and safest way to protect stones from the heat? W. S.

Mr. Rolliver stated that diamonds are the only stones that can be made hot or red-hot without their breaking, all other stones must be taken out if they are near the soldering place. Rings with stones in are generally soldered without taking the stones out if the ring has to be soldered at the lower side, but you must cover the head up to keep it from getting hot, we generally put the head of the ring in a small crucible full of wet sand, put a small piece of charcoal inside the ring under where you wish to solder and solder very quickly, with a hard fierce blaze.

POLISHING WATCH CASES.

Secretary Horological Club:

I wish to know how that fine polish is imparted to the inside of gold or silver plated watch cases. I have all the appliances for electroplating, but can not get the mirror looking appearance inside. If done by burnishing, please be kind enough to state a few rules how to use that tool; also, whether hard or soft rouge is used, and what kind of lath-buff. G. S.

Mr. Rolliver replied that it is done with a steel burnisher, which is polished very highly, and used with soap. The soap must be free from grit, and a little thinner than soft-soap, rub the burnisher quite hard upon the article you wish to burnish. A little practice is all that is needed to make you succeed. No buff or rouge is used when you burnish. You can polish the burnisher with a leather buff and rouge or Vienna lime.

ARTICLES ON THE DUPLEX ESCAPMENT.

Secretary of Horological Club:

Have any directions for putting the duplex watch in order ever been given by your body? If so, please give me an outline of it, and state the date of your meetings containing them. If not, do you know where I could procure something of this kind? I have lately experienced some perplexity in adjusting the roller jewel and balance, in a duplex movement. A. P. C.

Mr. Isochronal replied that "Excelsior" had given a full and exhaustive account of the duplex escapment in his Practical Hints on Watch Repairing, during the latter part of the past year. It was treated in his usual style, so well known to all readers of the CIRCULAR, as unequalled for clearness and practical value. Mr. C. should obtain those articles, as they undoubtedly formed the best treatise to be found on that subject for the practical workman, and comprised all that he would require to know. This would also answer the inquiries of C. S. C., A. L., B. W. R. and N. N., on the same subject.

TWO WAYS OF MENDING CELLULOID.

Gentlemen of Horological Club:

Moisten the ends to be united with spirits camphor, press together, when dry they will be firmly united. To assist this method, dissolve a little celluloid in spirits camphor, using the paste. Another way, dissolve gun cotton in ether, making a thick paste, (colodion varnish); color with carmine and apply to ends to be united. S. O. E.

Mr. "Smith" also writes that the receipt given by him in the February Club should read *one* ounce of ether, instead of ten, which was an error of the printers.

COLORING ETRUSCAN GOLD.

Secretary Horological Club:

Will some member of your Club be kind enough to inform me of a way to reproduce the color on "Etruscan or Roman Gold" jewelry after hard soldering? An expeditions and certain way, that could be put in practice in a country shop. J. D. H.

Mr. Blowpipe replied that, in soldering the article, it should be protected from the heat and air as much as possible, to lessen the discoloration, and save trouble in the subsequent cleaning up. A good protection is made from 1 ounce of borax that has been previously calcined and powdered, 1½ ounce common yellow ochre, ½ ounce aqua ammonia, and water enough to make into a thin paste. This is to be put on all the parts not designed to be exposed to the fire, but be careful not to have any where the solder is to go. Yellow ochre and water alone are sometimes used, but are not so good. There are also several anti-oxidizers on the market, well spoken of, but he had not tried them. The new flux for hard soldering, made by Mr. Gooding, of Waltham, Mass., is said to protect as well as anything can, and does not interfere with the flow of the solder, as the other means mentioned do if they get in the joint. Battery work, however, cannot be preserved from the action of heat by any protective coating known.

Having soldered the article, it is then pickled in the usual acid solution of 1 ounce sulphuric acid, to 5 ounces of water. If this does not clean it up well, boiling in a solution of fused cyanide of potassium 1 ounce to water 6 ounces, will in a great measure restore the color. The fine gold appearance is produced by immersing the article for a few minutes in a boiling solution of muriatic acid 3 ounces, saltpeter 2 ounces, salt 1 ounce. More or less of the solution can be made by preserving the proportions of the ingredients. This eats out the alloy and leaves a fine gold surface, and is to be used instead of the cyanide solution when a perfect job is wanted on Etruscan jewelry.

A well-known solution for coloring gold as in Etruscan jewelry, is given in the CIRCULAR, Vol. VIII, page 207, but there is an error in the second part of the recipe, which should read "5 ounces yellow beeswax, or 20 dwts. saltpeter; 20 dwts. common salt; 2½ dwts. copperas; 2½ dwts. white vitriol; 2½ dwts. alum." Many other solutions are used, almost every manufacturer having some process which he thinks superior to all others.

It should be mentioned that a considerable share of Etruscan jewelry is made so thin that the coloring process leaves the articles very fragile. When such an article is hard soldered, it would not be safe to put it through another coloring operation, and it must be gilt with a battery, using a plating solution that will give the proper color. When it is so thin, or broken in such a way, that it cannot safely be hard soldered, but must be mended with soft solder, it should also be electro-plated. A temporary color can be given to such jobs by painting over the defective parts with shell gold—but this is a mere makeshift, and should seldom be resorted to.

In cleaning up, the final operation should not be brushing with polishing powder, but washing with soap and warm water containing a little cyanide of potassium, just enough so you can smell it.

CUTTING ON PRICES OF WATCH WORK.

Secretary of Horological Club:

I have seen considerable in your proceedings about the experienced and skillful workmen giving their knowledge and mechanical experience so to speak, to and for the benefit of the ordinary workman. But I have not seen a word about keeping up a regular and uniform price for work. It is well known that the ordinary workmen, especially in country towns, are always cutting down the regular price of work, and to such an extent that the people of this (Michigan and the surrounding states have no confidence in *any* price. It seems to me that something ought to be done to establish a regular and uniform price all through the country, and that it would do as much towards elevating the art and the ordinary workman as anything else.

H. P. BEARDSLEY.

Mr. Clerkenwell said that the subject has been discussed by the Club, although not very recently. As Mr. B. remarks, it is an important one, and is one of the sorest spots of the trade, but a very difficult one to treat. It would hardly answer, however, to have a uniform price for all different localities as proposed. A jeweler in a city, where expenses were high and he had to pay his workmen large wages, could not afford to do work at the same prices as a man in a smaller place, who did all his own work, assisted perhaps by his son or apprentice. And, even where it could be afforded, he thought it would be difficult to enforce uniform prices on the trade.

Even in the same town it is hard to secure a uniform price among the different shops. If all are good workmen, they can meet and agree upon a schedule of rates, which each man will sign, pledging himself to do no work for less than the list prices. This is the usual course pursued. But even after securing such a mutual pledge, which, by the way, is a much bigger job to accomplish than any one who has never tried it would imagine, there are always some who will evade it, under some pretense or other. A common one is to say that, where there is a good deal to do to a watch, we must make a reduction from the full price of all the items. And some will "reduce" more than others, and cut under in that way.

But that is not the worst of it; men who would resent any imputation upon their honor will, after signing such a pledge, go and do the very thing they pledge themselves not to do. He had himself known of many such cases. Well, what is to be done about it? If the other signers make any blow about it, he will say we must make exceptions in some cases, and he reserves the right to use his own judgment in the matter, or he will withdraw entirely from the union, and have nothing more to do with it, but frequently will go to cutting under the rest who are still bound by it. If a penalty is attached to all violations of the pledge, he will refuse to pay it, and we can seldom compel him to do so. Or, if we draw up the pledge so as to be legally binding, hardly anybody will sign the bond at all. It was a difficult thing to get arranged satisfactorily, as the speaker knew by experience. In fact, he had never yet succeeded in arranging it satisfactorily, but had been forced to the conclusion, for his part, to let every one go to the devil in his own way. This was a hard thing to say, but it was enough to make a man feel so when he saw business men so narrow-minded, short-sighted, and jealous of each other, that they would not enter into a plan so plainly for their advantage, and would not keep their word if they did.

Let us now take the other case, when there are botches in the town, as well as good workman. The latter don't like to publicly agree to work for the same price as the botches, nor to recognize and honor them so much as to enter into any mutual agreement with them. The only recourse of the good workman is to fix his prices and live up to them, letting the botches do what they like. This is on the supposition that all the good workmen work together against the botches, but do not try to run each other at all. But where shall we draw the line between the two classes? One man may be well posted, but a poor workman, practically; another not posted at all, but a good finisher, or good practical hand at some other branch, which one is the botch?

But to return to our supposed case. One man charges, say $1.50 to clean and warrant an American watch, or $1.00 to clean and not warrant. A rival will both clean and warrant for $1.00. Will not the latter take the most of the work? What shall the former do? If he comes down to the same price, the latter will fall to 75 cents. Then what? It is all very well to say to each other, "fix a reasonable price and stick to it." But it is not very agreeable to see one's customers leaving their cash at other shops, even if he can afford it. But if he cannot afford it, then it pinches hard. On one side is principle and self-respect, on the other is his bread and butter. Shall he do what he thinks is right, and live in poverty, or lower himself to the level of the botches and compete with them on even terms? If he does the former, he may only be keeping up prices for the benefit of the botches, who will cut under just enough to get the work—and the money. If he does the latter, the probability is that prices will get down so low that there will be no profit to anybody, and he will have ruined the trade without being any better off than before. What *can* we do? If anyone can tell, in heaven's name let him speak. Several of the members spoke upon the subject, the feeling being that the good workmen should combine to keep up respectable prices and do good work, if they would not improve their condition, but probably the reverse, by pursuing any other course. Our readers who have any good plans or ideas for surmounting this evil are invited to communicate them. The Club then adjourned, without being able to attend to all the communications on hand. We hope, however, that our readers will continue to send them in, and they shall be attended to as promptly as possible.

Practical Hints on Watch Repairing.

By Excelsior.—No. 35.

THE SPRING-DETENT OR CHRONOMETER ESCAPEMENT—CONTINUED.

(562) Another cause of tripping is from the spring in the detent, from 1 to 2, Fig. 35, (or on the detent staff, in the Swiss style,) not being strong enough. In consequence, when the detent is freed from the unlocking pallet, it springs too sluggishly back to its place, not reaching there till the tooth which should have locked has passed the edge of the pallet, and the tooth *e*, Fig. 34, which should be at repose while the balance completes its forward vibration, falls upon the roller edge at *i*, and presses against it with the whole power of the mainspring, as described in (543). When the balance returns, (if no damage has already been done to the pivots, etc.,) as soon as the tooth passes into the hollow it drops from *i* against the pallet, through almost the whole 30° of the hollow, with still greater danger of injury.

(563) The usual way of trying the spring of an English detent is to press the escape wheel forward, while a tooth is locked on the pallet. But this is a rough test, of little value save in experienced hands, and a mere matter of guess work at the best. If the spring twists or buckles under this pressure, it is said to be too weak. But that does not necessarily follow. Even if but a slight pressure is applied in addition to the normal pressure from the mainspring, the yielding of the spring may arise from too much draw, or from the detent foot being displaced sideways. If the latter is the case, moving the foot to the right or left, where it should be, would prevent the buckling of the spring. In the former case, as the lower part of the pallet ring is immovable, (resting against the banking screw,) when the pressure on the upper part of the pallet is increased, the effect of excessive draw would be to pull the pallet over towards the wheel and so twist the spring of the detent, even if it was of the proper strength.

(564) To obviate this tendency, many workmen do not drill the hole vertically through the pallet ring, but at a slight angle, so as to hold the pallet inclining a little from both the wheel and the roller, *i.e.*, inclining the upper end towards *m* and *c'*, or between the two, so that only the lower part of the tooth rests on the pallet, at a point near its ring or pipe. It is true that if the pressure of the tooth was applied near the top end of the pallet, both pressing towards *m* and drawing it towards the wheel, while the lower end of the pipe rested against the banking screw, the spring 1 to 2, if weak, would be liable to twist. But if all the parts are truly vertical, and the pivots closely fitted, the tooth will bear on the pallet with its lower edge, near the pallet pipe, as well as with all the rest of its point, so that there should be no twisting unless the spring is very weak or the draw excessive. It is hardly allowable to make such variations from the rule that all the parts of a movement must be planted vertically, in fine work, but only in cheap work or such as is defective in the fitting of the parts, or lacking in accuracy of construction, as a sort of compensation for other faults.

(565) The same remark applies to the custom of inclining the upper edge of the impulse pallet *f*, Fig. 34, towards the approaching tooth, instead of having the pallet face vertical. It is claimed that the teeth wear at the lower part of their points more than at the top. But it is difficult to see why this should be so if the wheel is properly cut and planted in the movement, with the pivots well fitted and the acting points perfectly vertical. This departure from the rule, like the other, can only be considered indicative of cheap work. This should never be tolerated in a chronometer, which, if made at all, should be well made. An improvement on the foregoing test, (563) is to try the spring with the force of the mainspring. Supposing the watch to be wound up enough to get the normal pressure of the mainspring on the wheel, move the tooth back 12°, or half the distance between two teeth, and let it drop upon the pallet. This is a severer trial than it will ever receive in running, and besides is something definite, instead of being a mere matter of opinion as to the strength applied. If the detent spring bears the shock without yielding, it may be considered stiff enough for safety. But as even this mode of testing is scarcely satisfactory, we will consider others, more delicate and exact.

(566) To test the stiffness of the detent spring, remove the escape wheel, hold the movement edge upward so that the imaginary line *bc'* will be vertical, with *b* (or the escape wheel pivot hole) at the top. This is the worst position, for the spring has to raise the weight of the detent at every locking. Now move the balance slowly around till the detent drops, and see if the spring carries the detent promptly back to its place. There should be no doubt about this, but must be an unmistakable and vigorous promptness of motion. As the detent must complete its movement back to the set screw while the balance is vibrating through about 25°, at its center of oscillation and therefore at its greatest speed, any delay or weakness will be fatal to the running and dangerous to the pivots of the wheel and roller action.

(567) If there appears to be any sluggishness in the motion, during the above test, examine the detent, (exclusive of the spring part,) to see whether it cannot be made thinner and lighter without rendering it too weak or yielding. Detents are very commonly made unnecessarily clumsy and heavy. This refers especially to the English style of detent, in which any extra weight is injurious, frequently rendering it almost impossible to perfect the timing in positions. In the Swiss pivoted detent, or "bascule," this weight is not so objectionable, because, the two ends being perfectly poised, its action is the same in all positions of the watch,—although the increased weight requires a greater strength of the spring to revolve the bascule on its axis. But in the English detent, the spring (1 to 2, Fig. 35,) must be stiff enough to raise the extra weight to its place after every unlocking, besides an extra amount of stiffness to hold it safely there, against the danger of being thrown out by jars and shakes when in the position stated in (566), or with *b* at the top. The draw could also safely be less if the detent was made lighter. With these two improvements, the labor of unlocking, which retards the motion of the balance more than is generally supposed, would be so lessened that an increased diameter of the unlocking roller could be adopted without evil effect; while, on the other hand, the unlocking angle would be correspondingly reduced thereby—a positive advantage.

(568) Lessening the weight of the detent will generally require to be done by grinding with emery laps or coarse oil stone, as the detent is designed to be of spring temper from the foot to the ring. The nearer to the point the extra weight can be taken off, the more beneficial the effect, but any part that is unnecessarily clumsy and large should be ground down. For safety, it will be advisable to remove the locking pallet from the ring while doing this,—the gold (or unlocking) spring having of course been previously taken off. The lightening of the detent lessens the weight the detent spring has to raise when moving to the set screw, and is equivalent in effect to increasing the strength of the spring, but without the injurious resistance to the motion of the balance which an actual increase of strength would cause.

(569) On the other hand, the spring must not be too stiff. To test this, hold the movement in the reverse position, or with *c'* at the top, and cause the balance to vibrate freely. In this position the unlocking pallet, every time it moves to the right from the point of repose, has to raise the weight of the detent as well as to overcome the resistance of the detent spring. Watch the vibrations closely, and, if the labor of unlocking perceptibly checks the motion of the balance, (beyond the natural decrease of motion of the balance alone,) the spring is too stiff, or the detent is too heavy. Now vibrate the balance in the horizontal position, and notice whether the motion dies down at about the same rate, or continues considerably longer. In the former case, the spring is too stiff; in the latter, the detent is

too heavy. Finally, vibrate it in the reverse vertical position, or with the *b* at the top, and observe the motion.

(570) A good way is to turn the balance around a certain distance in each position, let it go, and count the number of vibrations before it becomes still. If it makes a certain number in the first position, considerably more in the horizontal, and still more in the third position, then it is evident that the weight of the detent is too great and has too much effect upon the motion of the balance; but if there is scarcely any difference in the number, in the three different positions, then the detent spring is too stiff,—so much so that the weight of the detent becomes comparatively of no consequence. This weight must of necessity produce some effect as it is joined with or opposed to the strength of the spring, except when the spring is relatively very stiff, which, in turn, then affects the balance injuriously. It is impossible to give directions for the exact medium of detent weight and strength of spring, as it must vary with circumstances. It can only be learned by experience. The workman should closely examine and test every fine chronometer which falls into his hands, and, he will thus gradually come to know, by a single repetition of the above tests, when there is a harmonious relation between the weight of the balance, the strength of the detent spring, and the weight of the detent itself, so that the spring may carry the detent promptly to its place, without being stiff enough to seriously check the balance vibrations.

(571) The five previous sections refer to English detents only. With the Swiss style, the tests in different positions would ascertain nothing, owing to the detent being poised. But if its hair-spring is too stiff, then in either position the same effect will be produced as is supposed to be the case throughout sections (569) and (570), viz.: that the labor of unlocking causes the vibrations to fall off too rapidly. A like result would follow, however, (even when the strength of the spring was correct,) if the detent was much too heavy, from the greater mass which must be suddenly started and moved by the balance at every unlocking. But in this case, the relative weakness of the spring would be shown by the sluggish motion of the detent back to its place after being relieved by the unlocking mechanism. All the tests mentioned in the five preceding sections are made with the escape wheel removed. If the detent spring, (either English or Swiss,) under these circumstances, is stiff enough to materially interfere with the free vibration of the balance. it should be weakened; for when the escape wheel shall be replaced in the watch, and the mainspring wound, there will be the additional obstruction of the "draw," which the balance must overcome at every unlocking, and this with the former will be so onerous as to prevent that freedom of vibration which is essential to fine time-keeping.

(572) But when the vibrations do not fall off rapidly, as thus far supposed to be the case, but keep up well in the first position, (566,) with the English detent, then, even if there is about the same number of vibrations in the other positions, no error can be inferred therefrom. Although the spring moves the detent without any great effort, yet the fact that it does not disturb the freedom of the balance vibrations shows that it is not too stiff, but that its easy control of the detent is due to the lightness of the latter,—all the parts being well adapted to each other. Another test is sometimes used, in any position, with a Swiss detent, but only in the horizontal one with an English detent, as follows: The watch being wound, turn the balance to the left very slowly, till the gold spring drops to its place against the detent point, then let the balance go. If the strength of the balance hair-spring is not sufficient to carry the balance far enough to unlock the wheel and start the watch to running, the detent spring is too stiff. In the case of an English detent, the test is carried further. If the watch does not start, as already stated. in the horizontal position, but, on the same test being applied when in the third position, or *b* up, (569,) it *does* start, then the detent is too heavy as well as the spring too stiff. But if the watch starts when tested in the horizontal position, but does not when tried in the first position, or *c'* up, (566), then the spring is correct, while the detent is too heavy, it being always supposed in these articles, when a test for certain parts is described, that the other parts connected therewith are correct. In the above trials the unlocking mechanism must be correct, and the proper amount of draw on the locking pallet, or this test would not be decisive as to the correct strength of the detent spring.

(573) When the detent spring is either too stiff or too weak, its strength can be readily altered, in the Swiss style, by turning the collet of the hair-spring upon the detent staff as required to produce the proper change. But the English detent is more difficult to alter. When the spring is too stiff it can be weakened by stoning down thinner with a wide bell metal or soft steel strip, and oil stone dust. Care must be taken to grind the spring perfectly flat, not rounding it off thinner at the edges, and to round up the corners at 1 and 2, instead of having the spring meet the heavier parts with square, sharp corners, much more likely to break. The spring must have an easy but perfect support on some flat surface, with projections resting against the sides of the large parts at each end of it, to hold it in place while grinding. Dress it down slowly, keeping the thickness perfectly uniform from end to end, and try it in the movement after a very moderate change has been made, so as not to get it too weak.

(574) To make an English detent spring stiffer, in a workmanlike manner, (without making a new one,) is rather difficult. If the detent is rather low tempered or soft, an improvement could be made by carefully rehardening, and not drawing the temper so low as before. The exact color will depend upon the quality of the steel from which it is made, as explained in section (12). But putting a finished detent through this process would not always result in any advantage, and in many cases would be utterly inadmissable. The liability to heat some part too much, to burn the steel, to warp in hardening so long and thin a piece, to get it out of shape, to have to dress off so much in refinishing as to get some part too small, or destroy the fit of jewel, steady pins, etc., renders this method one not to be advised for any but experienced hands, even when it is evidently admissable. But if the spring must be stiffened in some way. and the detent weight cannot be lessened (567) without weakening the detent, there are two methods followed.

(575) Workmen sometimes twist the foot or rear end towards the wheel, turning it about the point *m*, Fig. 35, the screw which holds it or about its steady pin. This increases the pressure of the spring towards the wheel, but should only be tried to a very limited extent. Besides the objection to altering the steady pin to admit of this change, it would carry the rear end of the spring, at 1, out of the direct line of support for the pallet, and, if the foot is twisted much, it will draw the pallet back towards *m*, and alter the inclination of its face. Furthermore, as the ring rests against the set screw as a fulcrum, the curving of the detent below that point, towards the wheel, will carry the detent point in the opposite direction, or from the wheel, and destroy the adjustment of the unlocking spring relatively to its pallet, thus deranging the entire escapement. A slight turn of the detent foot would not, of course, produce all these evils, but the foregoing shows the tendency of the operation, and if anything wrong is suspected all the above named points should be examined.

(576) Another way is to take the detent in two pairs of pliers, or stout tweezers, one holding the foot, the other the enlargement at 2. Heat the detent foot slowly with the alcohol lamp, till the faintest tinge of yellow appears, upon it but not upon the spring,—the latter being heated only by conduction from the foot. While thus hot, bend the part 2 to the left, or what would be towards the wheel, in the watch, as far as it is safe, and hold it so till cool. It will then have a slight curve at 1, towards the wheel, which will increase the pressure of the spring, although when screwed in place it will be as

straight as before. Any one trying this method should first take a piece of high-tempered spring, and experiment upon that before trying the detent spring. This method does not require any alteration of the foot or the steady pins, and if well done does not disturb the correctness of the locking or unlocking adjustments. The risk is in overheating the spring and drawing its temper; or in curving it too much; or not springing it over straight, but twisting it, so that the part from 1 to the point does not stand vertically, but tips over either to the right or left. It was my intention to consider the drops of the escape wheel,—first, from the point of rest to the impulse pallet, then from that to the locking pallet again. But as the directions already given include all that is practically important about the drops, it will be unnecessary to dwell upon the merely theoretical view of the subject.

NOTE.—In reply to constant inquiry about the "Practical Hints," I wish to answer, in this manner, instead of by letter, and shall hereafter refer all inquirers to this note for information.

"Practical Hints on Watch Repairing" were commenced in the CIRCULAR for April, 1875, Vol. VI., No. 3, and have appeared in every number since that date. The first fifteen articles treated on making, fitting and testing hair-springs and balances of all kinds, all the different adjustments required in even the finest watches and chronometers, as the adjustment for isochronism, positions, heat and cold, and rating, with numerous other cognate matters relating to watches of every description. These articles were republished in book form by D. H. Hopkinson, Esq., price $3.50, under the title of *A Pratical Treatise on the Balance Spring and Compensation Balance*, by EXCELSIOR, and they can now be obtained only in that form.

The present series of "Hints" began in July, 1876, Vol, VII., No. 6. The different escapements were taken up as follows: The Cylinder Escapement in Vol. VII., Nos. 7 and 8; the Detached Lever in Vol. VII., No. 9, to Vol. VIII., No. 7, or articles Nos. 19 to 29, inclusive; the Duplex in Vol. VIII., Nos. 7 to 11, or articles 29 to 33, inclusive; the chronometer began in Vol. VIII., No. 12, article 34, and is not yet finished. I have no back numbers, but all applications must be made to the publisher, who has only a few copies of Vol. VII., and the stock of Vol. VIII., is nearly all gone. The numbers previous to Vol. VII. were long since exhausted. How soon the present series will be completed and republished in book form, I am now unable to say.

How Pins are Made.

NO answer has yet been given to the inquiry, "where do all the pins go?" Certain it is, however, that millions are made every year and disappear to be trodden under foot of men and women. It is not more than half a century since buck-thorns were largely used in New England to pin up heavy articles, such as sacks of wool and coarse garments. Pins are very ancient; they are mentioned in the Bible as fastening the hangings around the court of the Temple, made large and of metal. Those used by Egyptian ladies were usually of bronze; they were slso made of gold and silver, seven or eight inches long, and had either a large golden head or a band of gold at the upper end. The Mexicans used as a substitute for metal pins the sharp end of the leaf or blade of the palm known as the Agave or Bayonet Plant. Before pins came into general use people had resource to ribbons, clasps, hooks and eyes, and thin scewers of gold and silver which were very expensive. These pins which were really only small scewers, were made on the continent of Europe in the reign of Henry VIII, and imported into England. An Act of Parliament during his reign forbade any person to put on sale "any pins but such as be double-headed, and have the heads soldered fast to the shank, well smoothed, the shank shaven, the point well and roundly filled, canted and sharpened."

The old method then employed was as follows:—The wire was first straightened by passing it between pegs arranged in a zig-zag manner, and then cut in lengths of six pins. Thirty to forty of these were taken in the hand at once and pointed at one end on a grindstone; a pin's length was then cut off and the process repeated till all the wire was used up. The heads were made by coiling very fine wire around a mandril and then slipped off the same; two or three of these convolutions were cut off for each head, then annealed and passed to boys who slipped them on the pin, and then fastened by a foot-worked hammer and anvil. The pins were then cleaned by boiling them in sour beer, wine-lees or tartar, and coated over by being laid in alternate grain tin; they were then boiled, washed, winnowed with a fan and given to women and children who stuck them in papers for the market.

In the new method the wire is drawn from a drum by passing it between friction rollers, each roller having part of its circumference cut away to form a flat face so that as the rollers revolve they seize the wire and draw it forward. When the flat faces come opposite each other the hold on the wire is relinquished, gripping it again when the flat faces have passed. The effect thus produced is to draw forward a certain length of wire, release it and then repeat the process until all the wire is unwound. The wire as it comes from these rollers is gripped between two dies or jaws, which separate from each other by a spring and are brought together at the right time and by means of a cam wheel; they grasp just enough wire for one pin and hold it firmly; the time of action of the cams is so arranged that they allow enough wire to pass between them before gripping the same, to serve for the head, which is made by means of a punch, hammering down the projecting end; a pin's length is detached by cutters, and at the same time the gripping jaws are released, and the pin, which only requires pointing, falls into a kind of trough, inclined sufficiently to allow the pins to be carried forward by their own weight, aided by the continuous shaking of the machine itself. The trough has a slit extending its whole length along the botttom, and is just wide enough to allow a pin to drop through as far as the head and move forward point downward. In this position the pins come in contact with a long grindstone of cylindrical form, and rotate against it on their own axis by a bar which traverses to and fro against their sides. They are thus evenly pointed and fall into a box placed to receive them. The brass pins are now rolled in barrels containing sawdust, then placed in kettles between plates of tin, forming alternate layers of pins. Diluted nitric acid is added, and the whole boiled for three hours. They are now taken out and again rolled in hot sawdust. The imperfect pins are separated from the perfect ones by a series of bands, having a combined horizontal and oscillating movement which throws off the smooth pins, and carries the rough and imperfect ones to the end of the belt. The pins are now ready to be put up either in boxes or papers, as may be desired. The operation of sticking pins is done by a very ingenious piece of mechanism, which, though simple, is not readily understood without an engraving.

The present generation, knowing nothing of the inconveniences of those days when trifling articles like pins and matches were almost unknown, can hardly appreciate their value. We can imagine that without these little pieces of mechanism dress makers and housekeepers would be a good deal puzzled to know how to get along.—*Scientific News.*

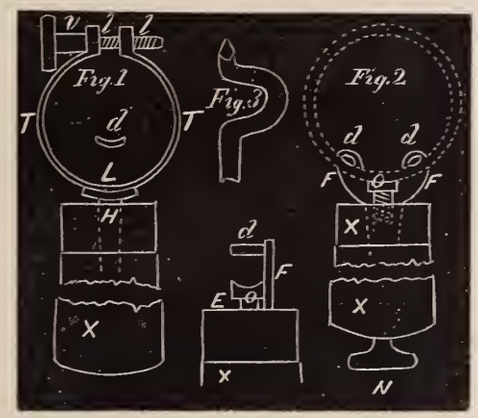
THE magnetic properties of pure nickel have been lately investigated by M. Wild of St. Petersburg, who procured a nickel magnet in the form of a flat-pointed bar, made by Wharton, in Philadelphia. The results are as follows: 1. Pure nickel takes, as compared with the behavior of pure soft iron, a considerable qualitity of permanent magnetism; but the maximum of this is only a half to a third of the permanent magnetism which may be acquired by hard steel. 2. The magnetism remaining in nickel after cessation of the magnetising force is less permanent than in well-hardened steel; the gradual loss of magnetism in course of time, both in warming and cooling, is in nickel greater than in hard steel, even when, by repeated heating and cooling, it has, like steel, been brought to a certain state of permanence. 3. The temperature coefficient of nickel magnets in the latter state is less than that of well-hardened steel. 4. The temporary magnetism which pure nickel acquires, is about double its permanent magnetising moment, half of the temporary magnetism which hard steel can acquire, and a fourth of that which soft iron can acquire. In its magnetic behavior nickel is thus throughout subordinate to steel and iron.

Engraving.

BY AN EXPERT.

FEW articles which the engraver is called upon to engrave offer as many difficulties as rings, which have to be marked on the inside—they are awkward to hold, and the ordinary graver does not seem to be the tool required for the job. Still the practiced engraver does not use anything but the ordinary square, or a slightly lozenge-shaped graver; and no holder except his sand-bag. But to do this successfully requires such an immense amount of practice that the ordinary workman can well be permitted to avail himself of some appliance to hold his work, and also have gravers so shaped as to facilitate the operation. Nine-tenths of the rings which are to be engraved on the inside are plain wedding rings. We will describe two styles of holders, and the reader can judge which would suit his purpose best. One of these will probably be patented, but if any party should see fit to make one for his own use no fault would be found.

A simple and inexpensive form is shown in Fig. 1. They consist



of a band *TT* of sheet metal (German silver is excellent) about three-sixteenths of an inch wide, and made concave, as shown in cross section at *d*. To the ends are soldered two pieces of thicker metal, as shown at *H*, and through these goes the clamping screw *v*. *H* is a tongue, also hard soldered on to the band *TT*, and goes into the handle *x*. The inside of the band *TT* should be lined with a piece of an old kid glove, cemented fast with shellac; this is to prevent scratching the ring. A person should have about four sizes of these bands, and graduated so in size that they would grasp any size of ring.

The engraving is done by holding the handle of the ring-holder in the left hand and cutting with the graver at the point shown at *L*. The thumb of the right hand can be rested against the handle *x* to give additional steadiness. After two or three letters have been cut the screw *v* should be slackened up, and the ring turned a little in the holder, so as to keep the part you are working on opposite to the point *L*.

Another form of holder is shown at Fig. 2. This holder is made of steel, and you would need about two, or, perhaps, three sizes. This style of holder will grasp any kind of ring for engraving on the inside. It consists of a strong piece of steel (*FF*), shaped as shown in the cut, with two flattened steel pins *dd*. The piece *FF* is firmly secured into the handle *x* by a tongue. *E* is a screw extending through the axis of the handle, and working through a nut attached to the steel piece *F*. *O* is a loose washer, attached to the end of the screw *E*, and prevented from turning by a flat side resting against the piece *F*. The top of this washer should be concave, and covered with several thicknesses of chamois or glove leather. It will be seen that if a ring is placed so that the pins *d*, *d* goes inside of it, and the washer *o* is forced against it by turning the milled screw-head *n* at the lower end of the handle, that the ring will be firmly held, and at the same time admit of using the graver on the inside between the pins *d*, *d*. This style of holder will hold stone and scale rings for engraving on the inside.

Gravers are made as shown at Fig. 3. These should be made and bent left and right, and are best made from pieces of Stubs' wire bent while red hot, and, as the process of bending will require several heatings, which will slightly injure the quality of the steel; this can be restored after the graver is filed into the correct form and it is heated for tempering. A composition of two parts of yellow prusiate of potash (ferro-cyanide of potassium), one part of borax, one part of yellow rosin; these are to be pulverized and thoroughly mixed, and the graver heated enough to melt the rosin, which will hold enough of the composition to the graver so that when it is heated to a pale red for tempering the loss of carbon in the tool will be restored, and the graver just as good as if tempered at the first heat. In tempering, oil (either lard or olive) should be used, and it should not be above 60 degrees F. As a rule, such gravers will not need any reduction of temper, but will be as hard and tough as can be desired. Watchmakers will find that gravers made and tempered in this way will stand better for turning than almost any they can buy—Stubs' steel wire, filed square, is all that is needed.

In engraving rings on the inside, the most of the heavy strokes are made with just the ordinary square graver, while the bent gravers are used for curves and hair lines, and, as a rule, the letters should be nearer perpendicular than in ordinary script, and the crooked gravers never used except when they are absolutely necessary. The same rules apply to script letters here as those given in our former articles. It will take some little practice to learn to whet and sharpen these curved gravers, and the points can be a little more *sled runnered* than the straight graver used for flat surfaces. In laying out letters on the inside of rings, all that is commonly used is just to rub the forefinger well in the hair and smear the little oil or grease adhering on the inside of the ring; next cut a piece of pigwood flat, and notch it swallow-tailed, with one prong the longest; now let the longest point run against the outside of the ring as a guide, while the short one makes a line in the dimmed and oily surface at an equal distance from the edge; apply the pigwood in the same way to the opposite edge, and the space between the two lines will represent the place and size of the lower case (or small letters) which you are to engrave. Of course you must cut your pigwood so that this space is of the width you desire; and the space above and below these two lines will be used for the top of letters such as capitals and the loops of l's and h's, and the space below for such letters as pass below like y's and g's.

The pupil should study and practice a bold heavy style for inside marking, otherwise in a short space of time all the hair lines will be worn away and illegible. All the lines should be firmly and clearly cut, avoiding running the lines too much into one another, but do not leave them so that the wear of a year or two destroys the elegance of the letters. Wedding rings are something ladies wear a great deal, and the durability of the engraving is a matter of vital importance, and a little care in this matter might make more odds with a customer than would be imagined.

The curved gravers should be a little on the lozenge shape. That is, the cutting angle should be about 60 degrees—*i. e.*, the angle of a three-square file. This is to secure a greater proportionate depth than the heavy strokes.

A little digression will be pardoned, I hope. As plain gold rings are among the most staple of a jeweler's stock, it is desirable to impress the purchaser thoroughly with the quality, and your own connection and guarantee. Few jewelers make their own rings, but even when they buy them there is nothing easier than to stamp them yourself with a clean, sharp-cut monogram of your initials. In a future article we shall describe stamp cutting, and the preparation of the steel for such work, and a great deal of the success lies in the preparation of the steel, or, to be plain, in so annealing the steel that a great deal of labor is saved.

The newest lace pins are composed of the whole Christian name, or of such mottoes as "Remember," "Forever," "Souvenir," or "Forget me not," formed entirely of diamonds, pearls, or other jewels standing out in high relief, with an almost invisible setting.

The Manufacture of Jewelry.

BY GEORGE WALLIS.

THE study of the historic styles of ornament, as applied to objects of personal decoration, together with those before quoted, as open to the student in a national museum, is of the greatest importance to the success, not only of the designer but the workman. Former methods of treatment, combinations of effect, and even, in some degree, of manipulation itself, may be suggested by the careful and intelligent examination of what has been done in the past; not so much, however, for the purposes of imitation, as to suggest a unity in the conditions of all good designs, viz.: adaptation of the object to use, the nature of the materials employed, and the handicraft, or mechanical methods, by which the design is to be realized.

Thus far I have been dealing very briefly with the production of jewelry in the various ages and countries of the world as an art, and not as a manufacture or industry, into which a systematic division of labor enters, for the purpose of economy, or on which modern science, in the application of mechanical and chemical means, has been brought to bear, to meet the extended and constantly extending wants of modern civilization.

With the increase of wealth, the extension of commerce, the growth of luxury, and let us hope, too, an advance in refinement, and a love of art, new wants have arisen as springing out of the old ones. These wants may take new forms, and manifest themselves when met, in new fashions; but the original sentiment is the same, and the personal decorations and jewelled adjuncts to dress of our day, stand in the same relation to the love of embellishment and ornamentation inherent in man, as it did thousands of years ago.

It is impossible to give any precise date at which the production of jewelry in its modern form commenced in Britain. It may be safely assumed that the Huguenot colony, which settled in Clerkenwell after the revocation of the edict of Nantes, although reputed to have been chiefly watchmakers, were also producers of objects used for personal decoration. In the early and middle portion of the last century, the production of silver buckles, which formed such convenient adjuncts to the dress of the ladies and gentlemen of the period, was carried on in Clerkenwell; and there is good authority for stating that ornamental steel work, which proved so very important an item of industry at Wolverhampton, was also carried on at Clerkenwell; and that a trade intercourse existed between Clerkenwell as the metropolitan centre of manufacture of personal ornaments, and the provincial sources of production, Birmingham and Wolverhampton. One of the most eminent steel workers of Wolverhampton in the last century, a relative of my own, an aged man when I was a boy, told me that he commenced his industrial career in Clerkenwell about 1770, with his uncle, who was a silver buckle maker to the Court, and that from about 1780 to 1792, he he had himself supplied large quantities of steel ornaments to the Courts of England, France and Spain.

The latter town was famous for the character of its artistic productions in steel, which found a ready market in London and on the continent of Europe. These works consisted of chains, chatelaines, buttons, buckles, clasps, etc. They were frequently embellished with the fine cameo-like productions of Wedgwood, in blue and white jasper, or painted enamels executed at Battersea and Balston, the latter being of a common character. Some of the more beautiful enamels were, however, imported from Paris, and sent back set in exquisite mounts of steel. Sword hilts too were produced in considerable numbers at Wolverhampton. This industry came practically to an end at the period of the first French revolution. It lingered in a very attenuated form for many years, but finally died out with the skilled workers who had at one period carried it on to their own profit and the national credit.

At Birmingham, the now famous workshops of Boulton and Watt, of Soho, as also many smaller manufactories, produced considerable quantities of articles not only in steel, which seems to have been a specialty of Wolverhampton, but in gold and silver.

The production of a special kind of jewelry was also carried on at Derby. These consisted in neatly designed pins, studs, brooches, and rings of a peculiar style of setting, still known among the seniors of the jewelry trade as the "Derby style." Birmingham and Clerkenwell appear to have finally divided the trade between them so far as any organization or aggregation of industry was concerned, and in all probability this arose out of the skilled buckle makers gradually adapting themselves to changes of fashion, the new generation of workers seeking to rival the productions of foreign jewelers, or imitate those productions, when brought under their notice by the merchants whose business it was to supply the demands of distant markets.

Lapidaries to cut the stones, real or imitation, with which the buckles and buttons are frequently set; engravers, enamellers, and chasers to embellish the metal itself; solderers to put the parts together, were so many skilled workers, ready trained to the use of their eyes and fingers, and therefore as a necessity arose out of a change of fashion, prepared to adapt themselves to new demands upon their skill. In addition to the buckle and button makers, there were the makers of watchkeys and seals, the latter certainly requiring the assistance of the engraver in the execution of the devices of various degress of intricacy. Intaglio heads sunk in steel were not uncommon in work executed at Birmingham in the last century.

The difference between the productions of Birmingham and London—for after all Clerkenwell is simply the jewelers quarter of the metropolis, was much greater a few years ago than it is at present. In Birmingham mechanical appliances may be said, from the beginning of the jewelry trade, to have been essential to its success, and the various methods of stamping shapes out of thin plates of metal, as originally used in the production of steel work and buckle making, and subsequently as applied to button making (at one time the great staple of Birmingham), influenced in a large degree the methods adopted by the jewelers of that place, as distinguished from the pure handicraft system followed in London.

These mechanical methods have now been developed to an extraordinary extent, and are necessary to the success of the large concerns carried on at Birmingham; superseding as they do to a very large extent the hand labor of the past, which is reduced to minimum in the production of articles in extensive demand. The design or pattern being once settled, the production of the article by the gross is rather a question of machinery and metal rather than handicraft and skill. The accuracy of the parts as wrought out by machinery is such, that practically the articles themselves may be said to be *flung* together by the hands of those who complete them. Even elegant designs for enamelled work, as well as imitations of engraved and engine-turned surface decorations, are now produced by "stamping" all the details at the same time, and by the same blow which gives the contour to the metal.

It must be distinctly understood that in thus sketching the growth of the jewelry trade as an important industry, I do not include in any sense the manufactories of high class and court jewelry, carried on to a very large extent at the west end of London, in which artistic workmen in gold are employed in the production of work of exceptional rather than general demand. Nor must it be forgotten that there is now a large and constantly increasing demand for artistic hand-made jewelry, which is supplied by many firms in Birmingham as well as in London, and that these articles are sent to the best markets in the world. Several of these firms employ designers on their own premises; and not only at the west end of London, but in Birmingham, there are manufactories where every workman is engaged in producing an object of jewelry by hand craft, with the original design placed before him.

I have so far traced, briefly, no doubt, but with a sufficiency of detail for all practical purposes, the origin and development of the manufacture of articles used for personal decoration in England. It is now desirable that the technical points necessary to an intelligent view of the nature of this industry should be considered.

Precious Stones and Gems.

BY EDWIN W. STREETER.

OPPOSED in some degree to all these theories, but ranging under class 1 rather than class 2, is the view of Simler of Breslau, that the diamond is the result of the crystallization of carbon from a liquid solution. According to his theory, carbonic acid collected, in far away times, in a number of cavities, and liquefied under great pressure ; that it dissolved some pre-existing form of carbon ; and subsequently that the carbonic acid became gradually dissipated through fissures and clefts, and the crystallization of the dissolved carbon began. Where the pressure suddenly abated, and in consequence a quick evaporation of the liquid occurred, a considerable compact mass of black diamond would be formed, such as is known in commerce as carbonado or carbon. It is very probable also that the rough, scaly, lead-colored rind, coating the rough diamond, may be due to vaporization thus suddenly induced. Many a puzzling appearance in the diamond can be explained if Semler's theory be accepted : the enclosed splinters of quartz ; the occasional feathers the peculiar form of that rough diamond in the British Museum which has a moderately large cavity, whence a small yellow diamond projects, as if it most certainly must have been thrown out in a liquid condition ; and finally there is that large diamond alluded to by Tavernier, in the cavity of which was found a mass of black carbonaceous matter, weighing from eight to nine carats, which he designated vegetable mud.

Which of these theories will have most weight with future generations it is impossible to say ; if the last, there would at first sight appear no insuperable obstacle to our producing some day an adamantine crystal artificially, although the conditions requisite for its hardness, brilliancy, and purity, essential to its value, might then, alas ! be as far off as ever.

Occurring in alluvial formations, the diamond, in common with other gems and the pearl, has not until late years been found of extraordinary size.

The localities of the diamond are India, Sumatra, Borneo, Brazil, and South Africa, some places in North America, the Ural, and the Australian mountains. Other localities have been pointed out, but confirmatory evidence is required. In 1833, it was reported that in the gold-sand of the river Gumel, in the Algerian province of Constantine, three diamonds had been discovered. The idea that Algiers was a land of diamonds seems to have been once entertained ; and Dr. Cuny, an African traveller, reported that a whole camel-load of diamonds had come from West Africa to Darfur in 1859. According to Murray a diamond was found in a brook in Ireland ; and Bowles insisted that diamonds ought to be found at Capo de Gat, in the south of Spain, because of its geological formation. Further Java, Celebes, and Columbia have all been pointed out as producing diamonds. Sometimes recognized localities are forgotten in books : thus Payen, in his book published in 1849, gives only India, Borneo, and Brazil, as localities for diamonds, whereas they had been discovered in the Ural twenty years before he wrote.

CAPE OR SOUTH AFRICAN DIAMONDS.

As I am writing a book on jewels, not for the year 1777, but for a century later, and in London, the greatest emporium and market of gems and precious stones in the world, I do not follow the topographical order of my predecessors. They would commence by descriptions of the diamond fields of India, and the bygone glories thereof : I begin with a chapter on the *Cape*, as South Africa is a richer field, and its produce is far more to the purpose of modern history, and to the supply of the precious stones which form our wealth of gems, than the old diamond fields of the East or West. So with a belief in the future of Queensland as a diamond field, I treat of the Australian stones also before the Indian.

Rather more than ten years ago, it happened that a child of Mr. Jacobs, a Dutch farmer settled at the Cape, amused himself by collecting pebbles from the neighborhood of the farm, near Hopetown. At first sight there might seem nothing remarkable in this circumstance, for pretty pebbles were to be had in plenty near the neighboring river. One of the stones, however, was sufficiently bright to attract the keen eye of the mother, though she regarded it simply as a curious pebble, and gave it little more than a passing glance. Some time afterwards a neighboring boer, named Schalk van Niekerk, visited the farm, and knowing him to be curious in such matters, Mrs. Jacobs called his attention to the bright transparent stone. So little heed, however, had been given to the pebble, that when wanted it was nowhere to be found ; and it was only after diligent search that it was at last discovered outside the house, just where it had happened to fall when the child had last used it as a plaything. Van Niekerk was sorely puzzled with the stone, yet thinking that it might possibly have some value, he offered to buy it of Mrs. Jacobs, The good woman laughed at the notion of selling so common a stone, and at once gave it to the enquiring farmer. Just then it happened that Mr. J. O'Reilly was returning from a hunting and trading expedition in the interior of the country, and to him Van Niekerk confided the stone, with a request that he would endeavor to ascertain its nature from any trustworthy mineralogist whom he might meet. By Mr. O'Reilly the stone was taken to the town of Colesburg, and there shown to Mr. Lorenzo Boyes, the Clerk of the Peace of the District. Mr. Boyes knew that his friend, Dr. G. W. Atherstone, of Graham's Town, was an excellent mineralogist, and, anxious to get his opinion, he sent the enigmatical stone through the post, accompanied by an explanatory letter. Had it been suspected that the stone was of any exceptional value, the envelope would no doubt have been carefully sealed, and the letter duly registered. As a matter of fact, however, the envelope containing the stone was simply gummed, and despatched as an ordinary letter. When it reached Graham's Town, the good doctor had some little difficulty in deciding what the curious pebble could be ; but after carefully examining the physical characters, after testing its degree of hardness, its density, and its behavior when subjected to optical tests by means of polarized light, Dr. Atherstone was bold enough to pronounce it a genuine *diamond.*

This was in March, 1867, and the Universal Exhibition in Paris was about to open in the spring. What more appropriate, the Doctor thought, than to send this stone to Paris ? Here was the greatest novelty the Colony could exhibit—the first African diamond ! *Semper aliquid novi Africa affert.* Dr. Atherstone accordingly communicated his suggestion to the Colonial Secretary, the Hon. R. Southey, and in consequence of this suggestion the diamond was duly conveyed by steamer to Cape Town, where it was examined by the French Consul, M. Heriette, who having confirmed Dr. Atherstone's judgment and determination as to the stone, forwarded it in due course to Paris. There it stood during the whole of the summer, and having been examined by savants of all nations, it was purchased at the close of the Exhibition by his Excellency the Governor of the Colony, Sir Philip Wodehouse, for the sum of £500. The weight of this diamond was $21\frac{3}{16}$ carats.

Such is the history of the discovery of the first Cape diamond ; a discovery which, being soon followed by others, led to the development of the great diamond fields of South Africa. These fields are situated chiefly in the Colony of Griqualand, West, which was proclaimed British territory in 1871. The new Colony is intersected by the river Vaal, and it is in the Vaal valley, and in that of some of its tributary streams, such as the Modder and the Vet, that most of the diamonds have been found. Drawing its head-waters from the Drakenberg or Quathlamba range of mountains, far away in the East, on the borders of Natal, the Vaal river, or the Ky Gariep, flows in a sinuous course, generally in a westerly direction, until it joins the Orange river, or the Nu Gariep. This, the greatest known stream in South Africa, runs for more than 900 miles in a westerly course, and finally rolls its burden of waters into the Atlantic. The diamond fields are situated in the neighborhood of the Middle Vaal,

about sixty miles above the confluence of the two streams. But though the chief productive localities are situated there, diamonds have also been found in the valley of the Orange river, at least fifty miles below its junction with the Vaal. In fact the area from which diamonds have already been obtained is of vast extent. To the north, it certainly reaches as far as Blomhof, near Pretoria, the capital of the Transvaal; and it is reported that diamonds have been found at least a hundred miles nearer the sources of the Vaal. On the south side of the Orange river, they occur some miles to the north-west of Hopetown. Jagersfontein, ninety-six miles south of the Vaal, is a well known locality; and a stone of seventy carats has been found at Mamusa, seventy-five miles beyond Jagersfontein.

Until the discoveries of diamonds directed attention to this district scarcely anything was known of its geological characters. Even now it is far from easy to co-ordinate the scattered notices which have been published in various journals, and thus obtain a clear notion of the structure of the country. Stripped, however, of all superficial deposits, the solid frame-work of the country appears to consist of rocks belonging to that great geological series which, from its conspicuous occurrence in the "karoos," or vast plains in the interior, has received the name of the *karob-formation*. This formation is devoloped to a vast extent in South Africa, occupying indeed by far the larger portion of the country, and covering at least 200,000 square miles, whilst its thickness approaches to something like 5,000 feet. For the most part it consists of shales and sandstones, which represent old deposits of mud and sand, now hardened and altered, but originally thrown down as sediments in a vast fresh-water lake. Africa is still famous for its large sheets of inland water; but the lakes in which the karoo beds were deposited are of great geological antiquity, probably corresponding roughly in time with the period at which the new red sandstone of this country was formed. Although for the most part destitute of fossils, the karoo strata are in places rich in organic remains, the most notable being the relics of extinct reptiles, which must have lived near the margin of the waters that deposited the ancient sediment. Some of these triassic reptiles were furnished in the upper jaw with a pair of tusks, not unlike those of the walrus, whence they were called by the late Mr. Bain, who discovered them, *bidentals;* and by Professor Owen, who scientifically described them, *dicynodons*. In addition to these remains of extinct animals, we find in many of the karoo beds numerous vegetable relics, in some places in the form of fossil-wood, whilst elsewhere the wood has been converted into coal. The coal seams of the karoo series occur especially in the upper part of the formation, and notably at the Stormberg. By the action of heat, some of the Stormberg coal has been converted into anthracite or steam-coal, a variety of fossil fuel peculiarly rich in carbon; whilst the occurrence of graphite, or "black-lead," in some of these beds, has been regarded as the result of further alteration of the coal. As graphite is but an impure variety of carbon, while we know that the diamond is simply a pure crystallized form of the same element, some geologists have been tempted to speculate as to the possible effects of further metamorphism upon the graphite, and have thus dimly seen in the vegetable fossils of the karoo formation the ultimate origin of the South African diamonds. If this metamorphic action has been found sufficiently potent to transmute vegetable matter into coal, then to convert this bituminous coal into anthracite, and possibly afterwards to transform the anthracite into graphite, why should its potency be arrested at this point? Let the same kind of action be continued, and we are brought to the logical conclusion that the ultimate term of the series will eventually be reached; and that ultimate term is assuredly represented by the diamond. Fascinating as such speculation unquestionably is, it must be admitted that we are at present far too ignorant of the conditions under which diamonds have been formed, to regard such speculation as anything but the vaguest hypothesis.

In some places the lacustrine shales and sandstones of the karoo formation are cut through by long dykes or veins of various eruptive rocks, known popularly as "trap;" whilst in other places similar igneous rocks are spread out in sheets which are intercalated between the sedimentary strata. It is in the neighborhood of these old lava-like rocks that the coal is locally converted into anthracite. But the "traps" associated with the karoo beeds have other points of interest in connection with our present subject. Varying considerably in their characters in different localities, some of them exhibit a vesicular texture, and contain in their bubble-like cavities kernels of chalcedony, agate, jasper and other siliceous minerals. By the disintegration of such rocks, the hard agates and kindred stones are set free, and carried down as pebbles by the rivers. Indeed the shingle of the Orange and Vaal rivers have long been famous for the beauty of its agates and other pebbles. In addition, however, to these attractive chalcedonic pebbles, the shingle contains fragments of a great variety of other minerals and rocks, of which comprehensive lists have been published by Prof. Rupert Jones, F.R.S. But among these constituents of the alluvial gravels, there is one mineral of paramount interest: the diamond itself. It is in the agate-bearing gravels of the Vaal and Orange rivers that the diamond washer has successfully established his "river diggings."

How the diamonds got into the gravels is a moot point, which has puzzled many a geologist. The rounded character of the pebbles, and the frequent presence of fragments of fossil wood, much rolled and water-worn, seem to indicate that the materials of the gravels must have travelled from a great distance. Zones of similar fossil wood are known to occur in the karoo beds of the Stormberg and the Drakensberg; and it has been suggested that the materials of the Vaal gravels have been brought down from the head waters of the river. From the appearance of many of the diamonds, and from the large proportion of broken gems, it has been argued that they must have travelled from afar, and the eyes of some geologists have been turned towards the distant hills of the Drakensberg as the possible home of many of these gems. It seems equally probable, however, that the diamonds may have been introduced into the gravels at some other part of the course of the river. In fact, Mr. Tobin, the pioneer of my Diamond Expedition Party, in 1870, has shown that the source of the Vaal is in sandstone, and that the agate pebbles are not to be found in the stream until after it has traversed a distance of several miles.

It should be remarked that it is not only in the present bed of the river that the diamond-bearing gravels have been found. Terraces of similar gravels run along the margins of the river, at a considerable elevation, and many of the larger diamonds have been found in these old high-level gravels. Such gravels unquestionably owe their origin to the former action of the river, when it flowed at a much higher level. Running water in the form of rain and rivers has indeed effected a vast amount of denudation in the valleys of these South African rivers: and in some places the karoo beds have been completely worn away, and the underlying older rock laid bare.

In addition to the deposits along the margins of the river valleys, there are superficial accumulations of gravel, sand, and clay widely spread over a vast area of the country. Diamonds have been obtained from these deposits, at localities many miles distant from any river. It has been suggested by Mr. Stow that such deposits of "drift," or unstratified materiels, owe their origin to the action of ice; and in support of such an explanation, he points to the fact that the drift contains irregular accumulations of boulders, many of which are smoothed and polished, while a few are scored and scratched, just as we know to be the case with fragments of rocks which have been subjected to the grinding action of a glacier. Mr. Stow's opinion as to the glacial origin of this drift has been endorsed by several other geological observers. It, therefore, seems not unlikely that a large proportion of the South-African diamonds, whatever their ultimate origin may have been, have at some period of their history been subjected to glacial conditions, and possibly brought into their present position by the agency of moving ice. This conclusion, however, in no way affects our former statement that the river gravels—deposits distinct from those to which we are now referring—were formed by the action of running water.

Various Processes of Coloring and Finishing.

BY G. E. GEE.

BEFORE submitting the work to the action of the coloring preparation just described, it should be very carefully examined, in order to detect and eradicate marks or scratches; and this part of the process should not be overlooked, as it is of great importance in dry coloring; in fact, the work cannot be too highly polished. This process has been already amply explained. Afterwards the work will require to be well washed out in a hot solution of soda, soap, and water, and dried in clean boxwood sawdust. According to one of the methods of preparation, it is then taken and covered with a layer of borax, which is best used for this purpose by taking it in the form of powder sufficient to complete the operation, and making it into a thick paste with water. The work may then either be dipped into this mixture or brushed over with it, and heated upon a clean fire until it turns nearly black, when it may be placed aside to cool; then boiled in clean diluted sulphuric acid pickle; rinsed well in clean water, and finally dried as before.

A very excellent plan, and one we have found to answer better in preparing the work for dry coloring than the above, is to well buff it upon a soft piece of felt, such as is used by lappers in putting that exquisite finish upon *bright* gold chains. This must be done after the washing out subsequent to the polishing. When a high degree of brightness is produced by this means, it will require to be again washed out; for perfect cleanliness is of the utmost importance in carrying out this process, as well as the minor ones. Everything prepared in this manner takes an exceedingly high and bright color, and is characterized by its general richness. Old work, or work to be re-colored, must be annealed before the process of polishing, and carefully all stones, etc., removed to avoid injury to them, in any of the operations attendant upon this or any similar proceeding. The following are the different modes of finishing the work.

After the proper color has been obtained and the work removed from the nitric acid dipping solution, it should be rinsed in a very weak solution of potassa made hot; in order to neutralize the acid upon it, which otherwise might be the means of the color becoming inferior after a time. It is then again rinsed in boiling water, and dried in clean warm boxwood sawdust, which should be as fine as possible, and which must on no account whatever be allowed to char or burn, or the beauty of the color will be impaired. A camel-hair pencil is a tolerably good instrument for removing traces of sawdust from articles so finished; and it is of the utmost importance that the work should not be marked or scratched during the processes of coloring and finishing. This kind of finishing is much admired by many, although burnishing is greatly preferred by others. This is done by rubbing the whole surface with tools suitable for the different classes of goods, which comprise various-shaped steel and agate burnishers; when any of these best suited to the work, are dipped in a solution of weak ale, or soap and water, repeatedly, and applied skillfully to all the surfaces of the work, a fine rich and brilliant color will be the result.

Superior articles of gold as regards quality, may be made to assume a beautiful deep color, possessing all the appearance of fine gold itself, by immersing them for a few seconds in the following mixture, which must, however, be carefully prepared. To effect this, take—

Sal-ammoniac . . .	4 ozs.
Saltpetre	4 ozs.
Borax	4 ozs.
	12 ozs.

Reduce them all to a fine powder and well mix together; the preparation may then be treated exactly as those before recommended, with the exception that dilute sulphuric acid should be employed for dipping, instead of nitric or muriatic. For dry coloring the solder used for the articles must be good; and the mixture of alloy of which they consist should have a preponderence of copper, the proportion of two parts copper to one part silver being a very convenient and useful amalgam to employ.

Some gold colorers prefer simply to anneal, and boil the work in aquafortis pickle only, in preparing it for coloring. No doubt this is a good plan, but it produces a dead appearance; the main object to be attained is thorough cleanliness, and this to a considerable exient depends upon the intricacy or simplicity of the work in hand. The simplicity of the modes of preparation which we have described are preferable, especially the one of buffing the work previous to its immersion in the color-pot; as thorough cleanliness is first obtained, and a subsequent brightness imparted, which is not lost in the color produced upon the work. We have invariably found a richness of color to result, unattainable by any other means; and we know further that it is always practised by an eminent London firm of goldsmiths. The brighter and cleaner the work, before submitting to this process of dry coloring, the richer and more beautiful will be the color effected by the chemical manipulation of this important art of the goldsmith.

In dealing with the, comparatively speaking, minor process—which, however, is much more extensively employed—commonly known in the trade as "wet-coloring," it will be best to inform the reader concerning the first, or theoretical principles, and then their useful application to this beautiful art, so as to render the information more perfect as regards practical utility.

Formerly it was an established principle, that to every ounce of work to be colored there should be one pound of color, composed of the following ingredients:—

4 ozs. of salt
4 ozs. of alum
8 ozs. of saltpetre

Here it is evident there was much misconception prevailing, the main supposition being that the amount of color required should be strictly in proportion to the amount of work *in weight*, and corresponding with the proportions we have given. Now this idea is erroneous. It is not in proportion to the weight of work that the color should be taken, but to the amount of surface presented to the action of the coloring mixture. For example, half a dozen solid gold chains might weigh as much as a dozen hollow ones, and yet the solid ones can be more effectually colored in half the mixture in the same time, because of the difference of surface in the two "batches" of work, and the quicker action of the color on plain surfaces. Therefore, the above rule is clearly wrong in practice.

Formerly, before the common qualities of gold articles were chemically treated for the purpose of imparting a fine rich color to them, the processes employed were French. The original process of wet-coloring could not be used for a lower standard of gold than 16-carats, but now any quality above 12-carats can be colored, and we have actually colored *11-carat gold*; the process, however, is a very delicate and skillful one, and one that could not be adopted from a monetary point of view. Since the adoption of this beautiful French art, numerous improvements have been brought to bear upon the subject, both from English and German workmen, and we may now almost consider that it has arrived at the point of maturity and perfection. It has extended gradually in the direction of the lower qualities until the supposed utmost limit has been reached; and in that direction the aims and successes of our own workmen have not been behind those of the foreigner. There are various methods employed by different firms, almost every one having a special mode of mixing, and thus a particular shade of color is given to the manufactures of each, according to taste or instructions; and the distinctive feature introduced is then considered a specialty of manufacture of the firm practising it.

On the first introduction of this art it was imagined that the presence of fine gold suspended in the coloring mixture would facilitate its action; accordingly plates of that material were suspended with

the work, in the color, and the workmen were sometimes charged by their employers to give the articles an extra dip or two into it, in order to increase the richness by a thicker deposit of pure gold By others 18-carat gold wire was always used to sustain the work whilst coloring by the wet process. Happily for the trade, all these conflicting ideas are dead and gone.

The ingredients employed in wet-coloring are all powerful agents in the dissolution of the baser alloy upon the surface of gold articles submitted to their action, and while dissolving this they have also a weaker action upon the gold itself ; therefore this coloring should not be carried too far. The correctness of these remarks is fully borne out by the proportion in weight lost in coloring, being greater in proportion as the quality becomes lower. We believe that by very skillful management it is quite possible to utilize a portion of the dissolving gold again ; for we have ourselves colored the commoner qualities with a loss of only three grains to the ounce. This we have done repeatedly, and our opinion is to some extent corroborated by the quickness of coloring produced by the application of old color, and the small percentage of loss sustained from the work. And further, if this old color is taken after having been several times employed, the amount of gold recoverable will be found to be very small indeed. To show that the gold dissolving from the surface of the work operated upon has an inclination to deposit a percentage of itself upon the same work again, we may mention that we have deposited a thick coating of fine gold upon the platinum wire with which we suspended the work whilst coloring. This is the result, no doubt, of some chemical phenomenon of which we cannot properly explain the cause ; but when we witness the beautiful color clear and quite smooth within itself, produced upon very common qualities, we cannot but surmise that something of this sort must be really going on during the action of the color upon the work ; otherwise these low qualities must appear very frost-bitten, and present quite an irregular surface. Having now laid down the general principles of the process, we shall at once proceed to details, taking the methods as they have been introduced into the trade since the commencement of the art in this country.

FRENCH PROCESS OF WET-COLORING.

Among the many methods for giving color to gold at the earliest period, for commercial purposes, was the following, which was decidedly the original wet process, introduced into England from France. The work should be annealed on a clear fire, boiled out in aquafortis pickle, and suspended in bunches upon fine silver or platinum wire; a quantity of boiling water should be provided before commencing the operation. When this is done, take—

Nitrate of potassa . . .	16 ozs.
Common salt	8 "
Alum	8 "
	32 ozs.

Reduce the above ingredients to a fine powder in a mortar; and well mix them together; then place the mixture in a good-sized pipkin or crucible, to which add sufficient hot water until it has the consistency of a thick paste; it should be heated very slowly, and must be well stirred with a wooden spoon, when it will soon boil up. The work must then be immersed and left suspended for several minutes, when it should be withdrawn and plunged into a portion of the boiling water, which will remove the color and show the progress of the operation. If the mixture should, during the time occupied in coloring, show a tendency to boil dry, an occasional spoonful of hot water must be added to thin it, but this should not by any means be added while the work is suspended in it. The color should be permitted to boil very slowly and steadily, and the work should not be alowed to remain in it too long at one time—six minutes at the most, and that only at the commencement; the subsequent dips should be more frequent, and the color thinned during the process. The latter, however, can be properly regulated only by practice, the best of teachers. On the introduction of the work it will become nearly black, and at each successive immersion it will be lighter, until the well-known color of fine gold is attained. The work should, in all cases, be allowed to remain in the color certainly not longer than twenty minutes; the time must be regulated according to the shade of color required; and the nature of the alloy acting more quickly when the proportion of copper is greater than that of silver, this should especially be the case, when the above mixture is employed.

When the operation is completed, the surface of the work will be perfectly uniform, though dull, but it may be made brilliant by burnishing or scratching. Previous to every dip the work should be well rinsed in fresh boiling water, and at the conclusion it should be swilled in the same manner, and dried in boxwood sawdust. Scratching colored work is a delicate operation, and requires care. It is done by the application of a fine brass wire brush and a solution of weak ale. Large plain surfaces should be very carefully scratched, but never crossways; if this is allowed to be done, little marks will be visible, and the beauty of workmanship and finished considerably impaired. This method should not be employed for a lower standard than 16 carats. Ten ounces of solid work with plain surfaces, and five ounces of hollow, can be effectually colored in the above mixture. The average loss in this process will exceed one pennyweight per ounce.

LONDON PROCESS OF WET-COLORING.

Gold alloys of not less than 15 carats in quality may be made to assume the appearance of very fine gold of a beautiful straw color, by boiling in the following preparation for a short time. Take—

Nitrate of potassa . . .	15 ozs,
Common salt	7 "
Alum	7 "
Spirits of salts	1 "
	30 ozs.

Reduce the above salts as in the preceding case to a fine powder; then take a large blacklead color-pot about eight inches high, and seven inches across the top, No. 16 size of Doulton's make; put about two spoonfuls of water at the bottom; then add the saltpetre, alum, and salt; place on the fire and very slowly dissolve and boil up, stirring well with a wooden spoon. Take the work, which has been well prepared by annealing and boiling out in aquafortis pickle, and suspended upon fine platinum wire ; put it into the mixture for five minutes, and at the expiration of that time withdraw and rinse well in clean boiling water, then add the spirits of salts to the mixture in the pot; when it again boils up, put the work in for four minutes longer, and again rinse in fresh boiling water. Now add one spoonful of water to the mixture, and when it boils up again put in the work for three minutes, and again rinse. Next add two spoonfuls of water to the mixture in the pot; when it boils put the work in for two minutes, and again rinse. Lastly, thin the color with about three spoonfuls of water, and when it boils up again, put in the work for one minute longer, well rinse in plenty of clean boiling water; the work is then done, and of a beautiful color. Finish as usual.

This process is recommended when it is required that the color should wear well; it will also produce a beautiful color if properly attended to, and these instructions are carefully carried out. It was regularly practised in London by most goldsmiths for a number of years with great success. It should not, however, be used for a lower standard of gold than 15 carats. The proportions given will color ten ounces of solid gold chains, and about five ounces of jeweler's work, which latter is generally of a bulky nature having large surfaces, The solder used upon the work must be very good to be nicely colored by this process. Some goldsmiths have strongly recommended the employment of common salts for plunging the work into, after the last dip in coloring, as a means of neutralizing the effect of any acid likely to be retained upon the articles. Others have advised the use of soda and potash solutions as substitutes for ale, in scratch-brushing. We may remark that we have tried these, as well as several others we could mention tending in the same direction, but cannot say that we ever derived any great advantage from the use of them. The loss by this process of coloring will average about one pennyweight per ounce of work submitted to the action of the mixture. Time occupied in coloring, fifteen minutes.

Gold-workers are exposed to several pernicious vapours in the exercise of their trade, by far the worst being that which arises during the process of wet-coloring; from the action of the spirits of salts upon the work and the other ingredients. The effluvia arising therefrom, in badly-constructed workrooms, produces great distress to the operator, affecting the head, the stomach, and the whole nervous system. When the above symptoms present themselves, a good drink of new milk will counteract the evil, and act as a complete antidote to the mischievous effects of the poisonous and other noxious vapors, taken into the stomach during the performance of any of these processes.

Astronomical Terms Relating to Time.

IT is because there is so much confusion in the minds of those who have not investigated the subject of Astronomy, that we are often met with inquiries relating to the difference between Apparent and Mean Time, Sidereal and Solar days, etc., and we are led to an explanation of these terms; not that there is anything new to be presented, but that, by "line upon line," certain fundamental facts in Astronomy may be made more familiar, and to watchmakers especially, inasmuch as the subject is intimately connected with art. For, it will take but little consideration to show that while Horology grows out of the demands of Astronomy, the mutual relation becomes so intimate, and the requirements of each so interwoven, that neither can fulfill its high purpose without being supplemented by the material aid furnished by the other.

Astronomy discovers and defines certain intervals of duration, determined by the movements of the various members of the Solar and Stellar systems; and according as it accepts one or another of these intervals as a unit, it measures the length or varying durations of the others; and the interval of duration between a particular epoch and another such is called Time.

The diurnal motion of the earth on its axis furnishes most readily a basis for the measurement of time, since the exact recurrence of each complete revolution constitutes a distinct interval, which we are compelled by our senses to accept as a unit of measure, because, as one side or the other of the earth is presented to the sun, we have the alternations of light and darkness, which, taken together as a whole, make what we call a day. But the length of the day, or a complete revolution of the earth on its axis, depends on how we measure it; for, if we do so with reference to the sun, we shall find it of a certain length of duration, while if noted with reference to the stars, it will be quite different, Let us illustrate this. Suppose we were situated on the edge of a horizontal revolving disc, and we notice at one point of our revolution that two remote objects, lying beyond the circumference of the disc, are in range, one of them being comparatively near. Imagine a line drawn from the center of the revolving disc through the point we occupy. It is evident every time we make a complete revolution we know it by the coincidence of this line with the two objects in range. Now, suppose while this disc is revolving about the nearer of the two objects, so that while it makes one revolution about its own axis it moves the $\frac{1}{360}$ part of a circle around the near object, It will be equally clear that after one revolution our imaginary line will not point to both the near and far objects at the same time; for when a complete revolution of the disc is made with reference to the near object, the farther one will not be in range, and consequently the length of the revolution of the disc will differ accordingly as we refer it to the near or distant object.

Now, if we transfer this idea to the Solar system, we shall find the same state of facts. We shall find the earth moving from west to east on its axis; the distant object will be a fixed star, and the comparatively near one the sun. Suppose we set up a transit instrument in the plane of the meridian so we may know exactly when the sun or star, by the revolution of the earth on its axis, appears to cross the meridian line. When the earth has made a complete revolution on its axis, it will also have moved forward in its orbit about the sun one day's march, and the same effect will appear as in the illustration, for the earth will revolve so as to get the transit instrument in line with the star earlier than with the sun. We may remark here that this fact accounts for the apparent movement of the sun among the fixed stars; for although they, from no part of the earth's orbit, present any change in their relative positions, by reason of their almost infinite distance, yet, as we revolve about the sun, that luminary is successively brought in range with, and appears to traverse the space occupied by the constellations comprising the twelve signs of the zodiac.

Now, if one revolution of the earth on its axis constitutes a day how shall the length of the day be determined; with reference to the sun, about which we revolve, or by reference to the stars, about which we do not revolve? We cannot use both intervals of time as the same basis of measurement. Astronomers, therefore, apply different designations to these unequal intervals, and call that marked by the successive arrival of a certain point in the heavens, called the *first point of Arise*, which is otherwise known as the intersection of the ecliptic and the equator, at the meridian of any place, a Sidereal Day, because made with reference to the stars; and that interval caused by the successive arrival of the sun at the same meridian, a Solar Day, for the reason that it is determined by the sun. So also, if the diurnal revolution of the earth be measured with reference to the moon, it will be still different, and such an interval would be known as the Lunar Day. Here we have, then, three distinct intervals, yet each generically termed a day.

The Day, then, being a natural unit of time, may be resolved into any number of subdivisions for the purpose of expressing smaller intervals of time; but custom arbitrarily divides it into twenty-four parts, or hours, and these again into minutes and seconds, as all understand, while the longer intervals are expressed in months and years. The subdivisions and multiples of the unit day are referable to the kind of day we take as the basis of division. Thus, Sidereal Time is duration expressed with reference to the Sidereal Day.

It has been found by long continued observation that the diurnal motion of the earth on its axis is exactly uniform, if measured with reference to the fixed stars; so that the interval between the successive transits of any fixed star is always precisely the same length; but this interval, or length of the Sidereal Day, is proved to be shorter than the Solar Day; and if the latter be taken as the unit, or twenty-four hours, then the former will be 23h. 56m, 4s. 09 of Solar time.

The day we most naturally fall into the use of is that determined by the revolution of the earth with respect to the sun, as already explained, and is of that length of time that elapses between the successive presentations of any point or meridian on the earth to the sun; or, as it *appears* to our senses, the upper transits of the sun across the meridian of any place, and is, therefore, identical with the day indicated by a correct noon mark, and is properly described as an Apparent Solar Day.

When the sun's center crosses or transits the meridian of any place, that instant is called Apparent Noon, and time reckoned forward from this instant to the return of the meridian, is called Apparent or True Time. And yet it is not the kind of time we use in civil affairs, or the ordinary customs of society; for, owing to the want of uniformity of the motion of the earth in its orbit, and to the inclination of the poles of the earth to the plane of its orbit, an inequality arises that causes the successive return of the instant of apparent noon with considerable irregularity; and the construction and use of a time-piece that would keep this irregular, or apparent time, would be inconvenient, if not impossible. So astronomers have devised a kind of time, based on solar time, in so far as it has the same number of days in the year, and is represented by a fictitious or supposed sun having a uniform motion, its time, therefore, showing a regular and equable increase, but each day of twenty-four hours being the mean or average of all the days in the year, and this is denominated Mean Solar Time. The term day, expressed with reference to the movement of the mean sun, is called a Mean Solar Day. Mean noon is the instant when this suppositious sun is on the meridian, apparent noon sometimes preceding, and at others, succeeding it. The difference between apparent time and mean time is called the Equation of Time, and is given in tabular form, in any nautical almanac, for every day of the year. By its use we may convert apparent into mean time, and *vice versa*. If the transit of the sun be observed with any instrument designed for that purpose but preferably a transit instrument, the immediate result is the finding the instant of apparent noon by the time-piece used. By applying the equation of time to this result, according as it is additive or subtractive, the instant of mean noon is found, as shown by the

same time-piece; or, in other words, its error, whether fast or slow.

In the method of reckoning, in ordinary use, the Civil day begins at midnight, and reckons forward twelve hours to noon, and thence twelve hours again, to the next midnight. The Astronomical day commences at mean noon, and twelve hours later than the Civil day at the same date, and its hours count from one to twenty-four continuously, to the succeeding noon. Thus, October one day eighteen hours, Astronomical time, would correspond to October two days six hours, A. M. Civil time. In nautical usage, the Sea day begins at the noon preceding the beginning of the Civil day at the same date.

United States Mint Items.

The two cent pieces were abolished five years ago.

There are five times as many one cent pieces used as three.

Less than $10,000 of one cent pieces were coined last year.

No fives or threes (nickel) were coined last year for circulation.

The old fashioned silver dollar has not been made for five years.

The shipping of silver coins from the Mint began about a year ago.

Silver is purchased at the Mint to a limited extent. It is paid for in gold.

The Eastern, Middle and Western States take most of the nickel and bronze coins.

Double eagles are being made for the depositaries, because they are more salable.

No silver is coined in subsidiary coin for depositors. The Government coins for itself alone.

In the South the people are now using one cent pieces and three and fives very extensively.

Five times as many five cent pieces as ones are sent away, and five times as many ones as threes.

There is no coinage charged on gold. The only charge is for parting, refining and toughening.

No silver is exchanged for notes at the Mint. This is done by transfers which come through Washington.

Two weeks ago nearly $300,000 in gold dollars were made for the Sub-Treasury Department of New York.

There are lying in the depositories and vaults of the sub-Treasury in this City nearly $300,000 in five cent nickel pieces.

Five cent pieces are circulated considerably in New Orleans. Pennies were recently sent to that city, which were the first ever called for.

The largest number of early orders for small coins came from the Southeast. Recent orders are chiefly from this section of the country.

A large amount of the $38,000,000 in small coins circulated within the year were manufactured during the same period, and consequently the coins are new.

The Government has issued over $38,000,000 of small silver coins since the redemption of fractional currency began, and the market is fairly glutted with them.

The demand for one cent pieces has increased within the last three or four months, and the demand for fives has decreased. This is due to the issue of so many dimes.

In brisk times the Mint pays out from three to five thousand dollars a day for the accomodation of people making change, and for shipment through the country.

No trade dollars have been made this year. Several millions were coined in 1877. Their coinage was suspended in December. They were only coined to a limited extent for circulation.

Nickel and bronze are kept at par by redeeming them in greenbacks. They are deposited in the Mint in sums of not less than $20, receipted for, and checks sent to the depositor.

No silver five cent pieces have been made for five years. In fact they have been abolished as well as the silver three cent pieces. The nickel threes are still issued although but few are used.

From five to ten thousand dollars of eagles, ½ eagles ¼ eagles, and $3 pieces are made every year in order to keep up the history of the coin. About $2,000 are made annually for the same purpose.

When business is brisk in the city about seven or eight hundred dollars a day in change is required for nickel and bronze. The railroad companies are demanding more than usual on account of the six-cent-fares. This demand, however, has fallen off somewhat within the last few days.

The Mint shipped over the country in 1876 about $500,000 in small coins, consisting of one, three and five cent pieces, They went chiefly West and East. In 1877, only about $386,000 in these small coins were shipped.

The authorities at the Mint can feel the pulse of business by the amount of coin sent in for redemption. If business is falling off the redemption is larger. When it is steady the redemption moves along at the rate of about $500 a day.

The greatest demand for silver coins is for the half dollar. The quarter dollar is the second favorite, and the dime is the third and last in the list. The demand for half dollars is twice as great as for quarters, and five times more halves are required than dimes.

Although more trade dollars were coined from April, 1873, to December, 1876, than were coined of the dollars of the fathers for the eighty-one years preceding, it does not follow that the trade dollar is popular. The trade dollar was intended for the China trade, and nearly all that have been coined have gone to China, Japan and India.—*Philadelphia North American.*

The Tempering of Steel.

BY M. E. J. HUGUENIN, GENEVA.

SINCE the first discovery of the marvellous property possessed by steel of hardening when heated to a high temperature and suddenly cooled, numberless attempts have been made to perfect the primitive methods employed. At the present day the different industries have various ways of tempering, and many workmen claim to have secret means of rendering the process assured and regular.

Generally, these methods are divided into two categories: hard tempering, made with water for articles required for cutting purposes, and soft tempering, made with oil, soot, etc., for articles requiring a certain elasticity. But this distinction, based on the substance composing the tempering bath, has nothing rigorously exact; the success of the operation, that is to say, the degree of hardness, depends more on the manner in which the article has been heated, the degree of temperature attained, and the skillfulness with which it has been plunged into the bath than anything else. Every one accustomed to tempering knows by experience that if the article heated has not attained a certain degree of heat it will not temper; if this degree has been exceeded, the steel becomes deteriorated, and no bath whatever is capable of restoring its lost properties. It is somewhat astonishing, therefore, that nearly all the experiments made should have been on the means of cooling the steel, and have stopped there. One of the chief difficulties to be determined is, how to obtain, in a precise and invariable manner, the exact amount of heat necessary; up to the present time, there has been great want of a simple instrument to determine this point. It is usual to approximately judge the temperature by the red tints, more or less bright, which heated objects take beyond 800 degrees centigrade. This method, simple and practical in appearance, has at the same time many inconveniences, and it is only long experience which teaches the workman where to stop. One of the principal obstacles is the absence of points of comparison. The eye is not a certain guide, and the impression produced by colors varies with different people. This explains the reason why the art of tempering is acquired by practice rather than by theory; the vague denomination of dark red, cherry red, and light red, only recalling tints momentarily perceived, are with dificulty fixed on the mind, and must be, especially for beginners, a matter of careful experiment.

In order to remedy this, I have drawn out a table representing the chief tints that a steel blade takes (which received honorable mention, Society of Arts, 1877,) and side by side with each tint is the approximate value in degrees centigrade. A second table records the temperatures below 350 degrees, the most used in manufacture. With such a guide a workman would thus have under his hand the means of greatly facilitating this difficult operation. I cannot flatter myself with having settled all the difficulties, but hope I have done something in our age of industrial progress, to resolve this question of high temperatures, one which is of equal interest to the industries of enamelling and porcelain.—*The British Jeweler and Metal-worker.*

Silver.

IF we consult Webster we find that silver is a metal of a white color and lively brilliancy, more elastic then tin and gold, but less so than copper, iron, or platinum. The elasticity of the value of silver is a quality not mentioned by Webster, but which has been the cause of considerable discussion of late in this country. If we look back to the Middle Ages, for before that time the value of precious metal was very variable, having no standard as a basis, we see that the art of making it bring interest, that is, endowing it with a fictitious value, was then merely in embryo, or that riches could only be represented by real estate or metals, not by paper. Silver has in all ages been used in the manufacture of artistic pieces ; and the reason that so few of them have reached us is that, outside of the pieces consecrated by the Church, for sacred purposes, the rest of the productions of craftsmen and artists were only what might be called "investments." If a prince or a baron grew rich, either by warfare or by commerce, he at once engaged craftsmen who turned his bullion into salvers, cups, tankards, and other pieces of plate, with which he proudly ornamented his sideboard and pompously displayed them when he entertained his liege lord or his vassals. But if war, famine or pestilence came, and hard times ensued, then the silver was sent to the silversmith, who made coin out of it. Thus in good times the silver was made into plate, and in bad times it was melted up and furnished money to help the owner out of monetary difficulties. This led, by a natural consequence, to the fact that the silversmiths became pawnbrokers and bankers. If the silversmith was rich enough to pay in cash for the artistic pieces he received to melt, he kept them, and, when better times came, sold them again to those who had given them to be melted, making them pay a price far above that which they were worth in weight. That was the origin of banking. The only silver work which made exception to this rule, and that only in very rare cases, was the Church plate.

In the eventful career of Benvenuto Cellini, when Rome was beseiged, he was ordered by the Pope to melt up all the sacred vessels and turn them into bullion ; and he got into trouble, for his artistic soul revolted against such a sacrilege, and he secreted some of the finest pieces of craftsmanship, which he was accused of having stolen.

It was in the thirteenth century that Church work in precious metals attained its highest artistic value ; and, soon after, Philipe de Valois, of France, recognized the silversmiths of Paris as an organized corporation, and they took for their motto: "*In sacra inque coronas*," "In the midst of crowns and sacred vessels." Soon after, a monarch of France promulgated the following order: "Orfévre ne deroge pas," meaning that a lady of the nobility might marry a silversmith without committing a *mésalliance*. In England "Guildhall" soon became a power, and was the starting point of the Bank of England.

It is singular to remark that on all occasions when inflation or paper money speculation occurred, a large amount of silver was made into table plate. When the speculations of John Law restored France, in 1717, to fictitious financial prosperity by flooding it with paper money, the silversmiths had more work than they could well manage, and in the last three months of 1719, only a few months before the great downfall of speculative riches of the country, more than nine millions of dollars worth of silver was manufactured into artistic work. This was, nevertheless, soon melted down in the hard times that followed that exceptional era of speculation. During the corresponding period in England, caused by the speculation known as the "South Sea Bubble," a similar reaction was visible ; and in the days of Queen Anne, owing to a similar cause, large quantities of silver were wrought into plate.

In America, for the last year, the silversmith's work has been in great demand, and art work has so far advanced that the productions of our craftsmen can stand their own against the best work turned out by the great English and French houses. The last Exhibition, at Philadelphia, gave European metalworkers much cause for reflection. The next Paris Exhibition will show that American work can surpass that of any nation or any person. We will speak more explicitly of this later. "The tendency of the American is towards materialism," said a French reporter, after the Centennial. "Not so," said the *Nation*, "for the finest work of art in the Philadelphia Exhibition, the Bryant Testimonial Vase, was made to commemorate the life and works of a great poet, William Cullen Bryant."

Antiquities from Central America.

THE steamer *Crescent City*, lately arrived from Panama, brought to this port a large collection of antiquities, mostly in stone or pottery, obtained by digging among the graves of a pre-historic race, once inhabiting Central America, of whom Stephens, Squier and other explorers have furnished detailed accounts. The consignment of new specimens is made to a house in Maiden lane. With something of the spirit of Di Cesnola in Cyprus, Schlieman at Mycenæ, and Layard at Nineveh, modern ethnologists and admirers of antiquities are hard at work among the ancient graves of Chiriqui, which became famous a few years ago on account of the numerous golden figures and ornaments recovered from them in a search for plunder. It will be remembered that a considerable amount of gold thus obtained was received by dealers in gold bullion in New York and forwarded to the melting pot in the Assay Office, except as some of the most valuable in point of workmanship were stopped *in transitu* by Professor Torrey.

The location of the Chiriqui graveyards, as described by the correspondent who made the new consignment to a New York house, is some 300 miles northwest from Panama, whence everything obtained by digging is forwarded to the sea-coast on the backs of pack-horses, over a rough, wooded trail, crossing several streams. The graves are found by means of an iron rod thrust into the soil after the manner of probing cheese, the object of search being detected by a peculiar ring when they strike the large flat stones with which the graves are covered. The distance below the surface is usually three or four feet, though occasionally it is necessary to go down ten or fifteen feet. Many of the graves most carefully constructed are observed to contain scarcely an implement, while alongside there might be a long narrow receptacle or depository containing numerous pieces. The interments appear to have been made through a broad region indiscriminately, with much loss of space, except as there was an arrangement in groups, and, as regards the latter, those graves which are more central are found to be richest in gold, the deceased being more favored in position according to wealth or rank.

The grave diggings in Chiriqui have thus far yielded to the explorer, Mr. J. A. McNiel, formerly of New York, about six hundred specimens of cut stones, images, pottery, etc., which are likely to increase in number as the work proceeds. Heretofore the search has been little more than pillage, but now it is proposed to explore systematically in the interest of science. Several Americans have already gathered important facts bearing on ethnology, serving to prove that the extinct races of Central America may have been contemporaries of the Egyptians. One circumstance of much significance is the reported finding of the rare mineral known as *jade*, described as a compact, light green, bluish or whitish stone belonging to the Nornblande family, but not to any distinct mineral species. It is found in China, New Zealand, and Northwestern America, and is worked into images and ornaments. It is conjectured that Chiriqui will yet yield up treasures of incalculable value to the antiquarian.

Kossuth Marx & Co. are making substantial improvements in Silk Guards and rendering them more attractive by mounting them with gold, and gold plate mountings. Messrs. Kossuth Marx & Co. are the *only* manufacturers of Silk Guards in the United States, and their productions enjoy a high reputation throughout the trade.

Mr. E. Aug. Neresheimer, the well known diamond importer, has removed from No. 5 to 23 Maiden Lane, second floor, front. The premises have been thoroughly renovated for his reception. Mr. Neresheimer will signal his new departure with an attractive display of diamonds of all grades and sizes.

Protest of the Jewelers' Association

AT a recent meeting of the Jewelers' Association the following resolutions, expressing the sentiment of the trade on the proposed reduction in tariff on jewelry, were unanimously adopted:

Whereas, It is known to this Association that the Committee of Ways and Means, of the House of Representatives in the revision of the Tariff, has in contemplation the reduction of the duty on jewelry, from twenty-five to five per cent. *ad valorem*, and, believing that the proposed change at this time is entirely uncalled for, and that the said change would cause to be thrown upon our market the refuse stocks of Europe, to be disposed of at any price to cover the cost of material, and believing that the amount of duty would be insignificant compared to the injury inflicted upon a large and important branch of American industry, and, believing that not only one but all branches of industry, while passing through the terrible commercial crisis and consequent depression of business which has continued from 1873 to the present time, with no signs of abatement, needs rather the fostering care of the Government than the hasty and adverse action proposed.

Therefore:—At a meeting of the New York Jewelers' Association, held at their Rooms, No. 658 Broadway, on Tuesday, March 12th, 1878, be it

Resolved,—That it is the sense of this Association while it recognizes the patient labors of the Committee of Ways and Means in so adjusting the Tariff that it shall provide for the wants of the Government, and, at the same time fall lightly upon the depressed and well nigh exhausted industries of the country, that no action is required on the part of Congress at this time to interfere with or in any way disturb the present rate of duty on jewelry. It was also

Resolved,—That these resolutions be sent to our representative from this city, Hon. Fernando Wood, Chairman of the Committee of Ways and Means, with the request that our remonstrance be placed on file, and if consistent with the sense of duty of the Committee, that our wishes as herein expressed may receive favorable consideration.

THE Ansonia Clock Company is about to introduce two interesting improvements in clocks. The one is an arrangement for setting a clock in beat, whether it stands level or not. The familiar arrangement in French clocks of having a spring socket screwed on the pallet-arbor for accomplishing this object is replaced by a new device in the following manner: Between the bent down ends of the brass strap attached to the pallets is inserted a small brass cup, containing a spiral spring, which when compressed causes this cup, to which the fork is attached to move friction-tight between the ends of the strap containing the pivot holes. As a matter of course, it is necessary, to construct the pallets so that both locking—or rather impulse faces should be equi-distant from their center of motion as without this the clock could not be set in beat by any such device.

The other is an invention of a new combination for striking the hours and half hours in such a manner, that the hands of the clock can be set backward or forward, without ever disturbing its striking the correct hour. Attached to the axis of the minute wheel are two separate wheels (each having twelve star-shaped teeth) so arranged, that they can revolve. The one at the back is shifted one tooth for each revolution of the minute hand, either backward or forward, as the case may be, and near its rim is inserted a *stop-piece*, corresponding with another stop-piece fixed in the other star-wheel. The latter derives its motion from a cylindrically coiled spring, which is set up and fastened with one end to the axis of the minute wheel and the other end to the star-wheel itself. As the minute hand proceeds on its revolutions the first wheel is turned forward one tooth each time, and the second wheel, on the striking train being unlocked, is *successively* thrown against the stop-piece the distance of *one tooth more* each time by the force of the cylindrical spring and is brought back to its normal position by the same wheel, which lifts the hammer for striking, one tooth for each blow of the hammer. This comprises the most essential points of the mechanism and for further explanations drawings would be necessary.

Foreign Notes.

The Municipal Council of the City of Paris has granted a piece of corporation ground at the Avenue de la Bourdonnaie for a workman's exhibition. A sum of £2,000 has also been voted to enable them to exhibit their inventions and products personally—an advantage of which they are generally deprived by the want of adequate means.

English watch makers are greatly agitated over a practice which has gradually grown up, of Hall-marking foreign made cases for foreign watches in England, and then putting in foreign works, and selling them in the Colonies and other parts of the world as English watches. The government has been asked to introduce a bill to prevent this being done, but as yet no action has been taken. At a meeting lately held in the city of Coventing, the whole system of Hall-marking was deprecated as doing great injury to the trade, and it is proposed that the whole matter be investigated by the House of Commons.

The Goldsmiths' Company of London have issued the followlng notice to the trade. It having been brought to the notice of the Goldsmiths' Company that articles of silver-plate in considerable quantities have been for some time past imported into this country from foreign countries and sold without having been assayed and marked as required by law, the Wardens of the Company consider it their duty to remind dealers in gold and silver-plate of the laws which prohibit the sale of foreign plate of gold and silver imported into this country, unless it be of one of the authorized standards, and shall have been assayed and marked; and the Wardens at the same time notify that they will consider it their duty to institute proceedings at law against offenders in every case of an offence committed in breach of the law which shall be brought to their notice and capable of proof.

The Goldsmiths' Company, with a view to the encouragement of technical education in the design and execution of works of art in the precious metals, have resolved to give an annual prize of £50 for the best design, and also £50 for the best model of some article in gold and silver which, when manufactured, shall exceed 30 ounces in weight, and an annual prize of £25 for the best execution and workmanship of some such article; three prizes of £25 each for the best design, model, and execution of some article of less weight than 30 ounces, and prize of £25 each for the best specimens of chasing or *repousse* work and engraving. Objects of jewelry and personal ornaments are not to be the subjects of design. All the specimens sent in will probably afterwards be publicly exhibited. The competitors must be British subjects, and the objects must be delivered before November next. The company have also resolved that a traveling scholarship of £100 per annum may be awarded to a student who has shown exceptional talent, and who shall have obtained a prize for design for three successive years, in order to enable him to study art in the precious metals on the continent.

Mr. Charles H. Upton, United States Consul at Geneva, Switzerland, communicates to the State Department a report on a trial of chronometers which lasted 52 days, from which we take the following data. The chronometers were kept at an observatory, being placed successively, for seven days, in different horizontal and vertical positions, and tested with heat and cold. The trials were classed under three heads, namely: 1st. The mean variation of the watch from day to day, which must not exceed ·6 of a second. 2d. The mean departure in each of the positions. This must not exceed 2 seconds: and, 3d. The error of compensation produced by the change of temperature; the maximum not allowed to exceed ·2 of a second by degree of thermometer. 84 chronometers were entered, 29 of which fulfilled all the conditions. The prize of honor was taken by a Locle manufacturer. The average variation of the winning timepiece was ·26 of a second per day; the mean departure in one of the seven positions was ·43 of a second; the error of compensation, ·01 of a second, and the variation of the running after and before the tests of heat and cold, ·33 of a second. Such accuracy can only be attained by long trained and consummate skill of eye and hand.

Workshop Recipes.

A GOOD SOLUTION for frosting silver articles may be found in the following: One dram of sulphuric acid in four ounces of soft or rain water. Heat the solution, and immerse the silver in it until frosted as desired. Wash clean and dry in boxwood dust.

SOLDERS.—Very fine and elaborate work is effected by using solders of different degrees of fusibility. For instance, a plate is soldered on with two-carat gold; in that, another piece with silver, and so on; each subsequent solder being more fusible. In this manner jobs may be repaired that it would be impracticable to do by any other process.—*Metallarbeiter.*

LIFTING SPRINGS are often broken, and the watchmaker has none of the right size, and has no time to make a new one. He can mend the old one and have it just as good as new, by placing the broken parts together, and binding them firmly to a piece of coal, and soldering them with 18-carat gold. It requires a strong heat and plenty of borax; then finish off nicely; harden and temper in the usual manner.

EXTRACTION OF SILVER FROM CYANIDE BATHS—M. de Bibra.—Baths of silver cyanide, the residues from galvanoprastic establishments, are precipitated with sulphuric acid. The precipitate contains all the silver along with copper, zinc and iron. It is ignited, and the residue is treated with nitric acid, which dissolves out the silver, zinc and copper. From this solution the silver is thrown down as chloride. The portion insoluble in nitric acid contains carbon, ferric oxide, and traces of silver, which may be extracted with ammonia.—*Journal fur Praktische Chemie.*

PIERCING TEMPERED STEEL.—Let your drill be oval instead of the usual form, and temper it as hard as possible without burning it. Touch the surface of the metal to be pierced with a little nitric acid moistened with water. Commence your work by moistening the drill every now and then with essence of terebinthine instead of oil (some workmen use kerosene or good rectified petroleum, in which some camphor has been dissolved). When the drill ceases to bite, and the bottom of the hole is polished, rub the former with the terebinthine or kerosene, drop ln a little acid to take off the polish, and continue to pierce. This operation is somewhat tedious, but very certain.

PARALLEL RULES.—For lines parallel to the sides of the drawing board the T square is the best possible parallel ruler, and may be used in conjunction with set square of 45° for mitre and similar lines. The set square of 60° by 30° will give increased facilities in setting out many ornamental geometrical forms. A T square with shifting head is also very useful, but as ordinarily made it is clumsy. For parallel lines not falling within the range of the T and set squares, the best tool, in the opinion of many, is the rolling parallel ruler. This is more quickly set to any two points, and more cleanly in use than any other form. A plain black ebony one is the best for general use. A set square and straight-edge are used by many, but they more easily get out of place and soil the paper. Set square and T squares should be French polished, and then they can easily be cleaned.—*Technologist.*

A FOREIGN contemporary gives the following for cleaning Swiss bridge, lever or cylinder watches: A small stand of gilded brass, about 1¼ inches in diameter, and turned round in a lathe, is employed. The latter is mounted on a firm base, with a stud in the centre running up to the plate; and this is engraved the shape of a watch movement with the bridges on it, and the screw-holes drilled in. When the watch is taken down the screws are placed in the holes as in the watch, and then left there until ready to put up again. Thus they never get mixed, and may be cleaned by carefully drawing a brush over them. The other arrangement is a tapering punch, something like a "pusher," used for pushing rivets out of pins, etc.; and after cleaning the bridges in a paper, as usual, the punch is pushed in the screw-hole with friction enough to prevent slipping. A fine brush is used for finishing.

INFLUENCE OF LIGHT ON METALS.—Some time ago M. Siemens discovered the influence of light on the electrical resistance of selenium, and constructed a new photometer based on this principle. Recent experiments have shown that light similarly acts upon tellurium, but in a less degree. In a note to the Philosophical Faculty of Heidelberg, M. Boernstein states that light also effects platinum, gold and silver, and probably all the metals.

IT IS ASSERTED by Sig. G. Pisali that elasticity of metals at different temperatures present two distinct periods, viz.: In the first the total number of oscillations varies in a somewhat irregular manner, and the wire, when it comes to rest, is permanently in a sensible state of torsion. On continuing the oscillations at various temperatures between the fixed limits, however, the wire gradually passes into a definite normal state for the given limits of temperature in which these irregularities disappear. If the temperature be then raised higher than the former limit, the wire passes again into a variable state, which only becomes normal after long continued oscillations. A change in the weight of the counterpoise, or a suppression of the tension for a short time, also alters the elastic state of the wire, which becomes normal only after frequent repetition of the changes in the conditions of experiment with long continued oscillation. From this it will be seen that the determination of the constants, which refer to elasticity of torsion of the first and second order and the law of Coulomb itself, should be made with wires in a normal elastic state. The application of this to instruments of precision in which the torsion of metallic wires is employed is self-evident. Great theoretical interest attaches to the phenomena of elasticity of the second order, for if this force is really due to friction between the molecules, of which bodies are composed, it must have some relation to the form of the molecules, and the study of the phenomena it produces may lead to a knowledge of a relation between the physico-mechanical structure, and the chemical quantivalence of the elements.

REDUCING SILVER IN THE WET WAY.—Every chemist is familiar with the reduction of chloride of silver in the form of powder by means of metallic zinc in the presence of a little free acid. It is not easy to bring two such substances as the silver salt and the metal into close contact, and after the work is accomplished the removal of the excess of zinc has its difficulties. Dr. Grager suggests a modification of the old method that ought to be more generally made known. The chloride of silver is dissolved in ammonia and poured into a well-stopped bottle, and into this is introduced an excess of metallic zinc, in not too small fragments, so that any reduced metal adhering to it may be readily washed off. The decomposition begins immediately and is rapidly accomplished, especially if the contents of the flask is well shaken up. Three hours will suffice to reduce one quarter of a pound of chloride of silver. It is easy to ascertain when the reduction is ended, by testing a portion of the ammonical solution with hydro-chloric acid. As soon as no cloudiness or curdy precipitate is formed, the work may be regarded as completed. A slight excess of ammonia is said to be favorable. The reduced silver must be washed with water until all odor of ammonia has disappeared. The pieces of zinc are removed by pouring the contents of the flask through a funnel, the opening of which is too narrow for the passage of the zinc fragments, while the reduced silver can be easily washed through. The finely divided silver can be digested in hydrochloric acid to restore it to a pure white color, and it is then ready for solution or fusion, and will be found to be perfectly pure. In dealing with large quantities it would be economical to recover a portion of the ammonia by distillation. In the same way an ammonical solution of nitrate of silver can also be reduced by zinc, and the silver obtained pure, even when the original solution of the nitrate contains copper, provided a small quantity of silver be kept in the bath. It is better where copper is present not to take all of the zinc that may be requisite for the reduction of the silver. It will prove a great convenience to be spared the necessity of converting the silver into the chloride, as it is no easy task to wash out this salt on fllters, and it will be found to be applicable to alloys which do not contain more than 25 per cent. of silver.—*Journal of Applied Chemistry.*

Trade Gossip.

A bronze bust of Pius IX. is on exhibition at Tiffany's.

The newest bracelets are serpents of gold scales with jewels for eyes.

E. Aug. Neresheimer has removed from No. 5 to No. 21 Maiden Lane.

The Clan-Gorham style of ornamentation is among the richest of the new effects in gold.

Messrs. Bartens & Rice, importers of fine watches, will remove May 1st, to No. 20 John street, first floor.

Mr. L. Kahn sailed for Europe, in the Germania, Saturday, March 2d. and is expected to be absent some time.

Over $200,000 worth of American clocks have been shipped for Australian market within the last four months.

Mr. Louis Strasburger the well-known watch importer has taken passage in the Britannic which sails for Europe April 27th.

Chas. S. Mosely, late of the Elgin Watch Co., is with the Lancaster, Pa., Watch Co., endeavoring to resurrect that defunct institution.

Insects (as flies, beetles, etc.,) are again becoming popular in jewelry. Large silver and gold bees are shown, with costly jewels for eyes.

Bangle necklaces, passing over the head in the same way that bangle bracelets do over the arm, are among the novelties of the season.

Here they go. A "ninety-nine cent store" has gone up in a twenty-five-cents-on-the-dollar balloon. Point of ascension—Paris, Kentucky.

Mr. B. H. Knapp, of the well known house of Wheeler, Parsons & Hayes, has led to the hymenial altar Miss Ketchem, one of Brooklyn's fairest daughters.

A new fancy in jewelry, just on the eve of introduction, is of fine gold or silver wire, twisted to resemble cords. Ear-drops, medallions, finger-rings and bracelets are all being made in this manner.

The acme of recorded cheek is that of a Maine debtor who coolly informed his creditors that he would pay no attention to their dunning letters hereafter, unless they enclosed a stamp for reply.

At a recent sale of coin at Clinton Hall, a California octagonal gold dollar brought only $1.12, while a silver half dollar fetched the enormous sum of $172.50. Several "silver" men in the audience were seen to pick up their hats and leave.

The firm of Freund, Goldsmith & Co., is dissolved by mutual consent. Messrs. Max Freund and Adolph S. Freund, of the late firm, have formed a copartnership, and will continue the business under the firm name of Max Freund & Co.

Mr. Adolph Goldsmith, of the late firm Freund, Goldsmith & Co., has formed a copartnership with J. Schleisser, under the firm name of Goldsmith & Schleisser. The new firm will devote their energies to the manufacturing of jewelry and importing of watches.

Messrs. Knoeller, Schuetz & Gantter, for many years in the employ of Ralph D. Earle & Co. and their predecessors, have formed a copartnership for the purpose of conducting a manufacturing jewelry business. Their specialty will be fine jewelry and diamond mountings.

J. L. Ridenour, a jeweler doing business in Arkansas City, Kan., was recently robbed of a number of customers' watches and a few objects of jewelry. The missing property was found concealed in the town, and suspicion was so strong against Ridenour as to cause the authorities to place him under arrest.

It is reported that a Maiden Lane establishment have in there vaults for safe keeping the jewels of Mrs. T. P. Bell of San Francisco, wife of one of the directors of the Bank of California. Her collection of gems is estimated at $250,000 and are said to be the finest owned by any one lady in the United States.

Messrs. Aikin, Lambert & Co., who are always seeking something new, have cornered the market on Florida beans, and have got out a new line of goods, consisting of lockets, extension pencils, masonic badges, chains, pendants, watch-keys and emblems. These goods are very pretty, and will, doubtless, become popular.

A business firm in Newark, to which a bill had been owing for some time, finally sent a sharp dunning note to the debtor; and received in reply a postal card containing the following: "Matthew xviii., 26." To this they responded: "Romans xiii., 8; St. Luke, xiii, 58." The result was the prompt return of a check in payment of the amount.

Mr. J. Laurent, watch case maker, of this city, is erecting a building at Linden, N. J., which he expects to occupy about May 1st, for the purpose of manufacturing gold and silver watch cases. Increasing business has crowded him out of his old business home at No. 17 John street, and compelled him to seek greater manufacturing facilities in order to supply the demand for goods of his make.

Mr Albert C. Potter, well known as the maker of the Potter watch, has been elected a member of the Horological Commission of the city of Geneva. This is very high honor when it is remembered that Mr. Potter is an American and that he has won this distinction in the headquarters of the Swiss industry. The Horological School, of which Mr. Potter is now a Director, is owned and controlled by the municipal authorities of Geneva, who are now expending a million dollars on the building for its occupancy. We have no doubt whatever that Mr. Potter will infuse into the institution some good square American ideas.

We learn that the house of Savage, Lyman & Co., the distinguished jewelers of Montreal have narrowly escaped an ingeniously planned swindle well calculated to deceive the most alert business men. A few days ago a party entered their store and presented a letter of introduction from one of the bookkeepers of the Windsor Hotel and stated that he desired to purchase an English watch and chain. He selected one valued at $170 offering in payment a check for $525 purporting to be certified by the Merchants Bank of Canada. The firm took the check, and handed the watch and chain and $355 in money. They subsequently asertained that the check was worthless, and shortly after the detectives arrested their man at St. Hubert, and conveyed him to Montreal. The prisoner is remanded for examination.

Messrs. C. G. Alford & Co., publish elsewhere a four page addition to their illustrated catalogue. This shows that this enterprising firm have no intention of resting on their laurels but intend to keep trade lively. The catalogue which they have already published has proved a great success and Messrs. Alford & Co., have reaped the reward due to them for protecting the interests of the retail trade as they have done. They have steadily refused to supply outsiders with trade information, and have been well supported by their proper and legitimate customers. Messrs. Alford & Co., are thoroughly responsible and their representations may be implicitly relied upon. They now publish to the trade the latest novelties, and will forward the price list to their patrons upon proper application.

The King of Spain has presented to his young bride, the Infanta Mercedes, an elegant casket manufactured in Paris. It is of lapis-lazuli, mounted on four lions' claws for feet; it is ten inches high and twenty long. Its sides are ornamented with a profusion of wreaths of roses in gold and of all colors, and of marvelous workmanship. The key itself is a masterpiece of jewelry, and has the form of a full blown rose with a bud. The interior is set with diamond studs. This box is destined to preserve the letters of the young couple before their marriage; but in the meantime it will contain a gift of a splendid necklace of eight rows of Indian pearls from the royal bridegroom. The presents offered by the French Government to the King of Spain, on the occasion of his marriage, have just been sent off. They consist of two Sevres vases, forty-eight inches high, and a center piece of the same manufacture. The groundwork is of light blue, and the sides are ornamented with paintings in oval.



THE

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THE RECOGNIZED ORGAN OF THE TRADE.

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To the Trade.

This journal is published on the 15th of every month, and will, on receipt of the yearly subscription of $2.00, *be forwarded regularly to any address in the United States or Canada for twelve months. The present volume commenced with the February issue, and intending subscribers can be supplied with back numbers so as to have the volume complete.*

The East and the West.

THE calm indifference and apathy displayed by the capitalists of New York, at the loss of our trade and commerce that is constantly going on, is simply wonderful. Year after year we witness an increased diversion of trade from our borders, and no effort is made to either recover what we have lost, or to retain that which remains. We see Congress passing laws aimed directly at the business interests of New York, without a protest, and behold the great transportation lines, by sea and by land, combining to rob us of our commercial and manufacturing importance, and no action is taken to prevent these schemes being successfully carried out. It is true that some of our business men, appreciating the evil that is being worked, have made some speeches and passed some "resolves" condemning those who seek to rob the metropolis of its commercial importance, but as far as action to prevent it there has been none whatever. The severest blow our trade received was when Congress passed a law permitting imported goods being discharged at this port from ship to railroad, and passing through in bond to western cities. This was a master-stroke for the west, for it enabled western dealers to import their goods direct, and gave them the added opportunity for smuggling which the long lines of railroads afford. They availed themselves at once of the advantage they had gained, and filled Europe with their agents to compete with New York buyers. They entered into combinations with the transportation companies also, by means of which the goods they purchased were delivered in bond in western cities as cheaply as they could be in New York. Thus the New York merchants find that, instead of selling imported goods to the west, the western dealers are actually invading the district east of the Alleghanies, and underselling them in their own territory. The great west has been justly termed the granary of the world, and, in order to secure the transportation of its products to European markets, the railroad and steamship lines have found it to their interest to discriminate in their favor in the transportation of western-bound freights. For several years this discrimination has been going on—some, at least, of the lines terminating in this city consenting to it—and yet New York business men have taken no steps whatever to counteract the movement.

Boston, Philadelphia and Baltimore have profited largely by the decrease of New York's trade, and have spared no effort to secure for themselves what we had not the enterprise to keep. The statistics of exports and imports demonstrate the truth of this statement, and also conclusively prove that an active and fatal discrimination in transporting freights has been made against New York.

With the impetus thus given to direct trade with the west by Congress, every influence has been at work to build up the manufacturing and jobbing interests of that section. That these efforts have not been in vain is shown by the immense jobbing and manufacturing establishments which exist in Chicago, Cincinnati and St. Louis, whose salesmen may be found constantly on the road selling their wares at New York prices, and even competing in eastern territory for the trade which New York should control. We do not complain of the enterprise of the west; on the contrary, it is their right and their duty to look out for themselves, and the energy they display is calculated to improve business in general, and to create a demand that would not otherwise be felt. Our grievance is that New York business men do not make that effort to keep what belongs to them that they should do. The manifestation of one-half the spirit and enterprise that is shown by western men would have resulted in the maintenance of that commercial supremacy which has so long been our boast, but which is fast slipping away from us. What we have lost can only be regained by a combination of effort and the expenditure of large sums of money. The west has been taught to look upon the business men of New York as grasping capitalists, and "bloated bondholders," oppressing the hard-working industrial classes, and squeezing the heart's blood out of them. This has been so drilled and hammered into the heads of the masses by the unscrupulous politicians, who were aided by the business men for their pecuniary advantage, that there has grown up in the west a bitter hatred of the east, but especially of New York. Having been, in a great measure, driven from the markets of the west, New York has had little opportunity to counteract this influence, and to-day we are regarded as grinding creditors of the west, whose just dues should be repudiated. This feeling of hostility is growing stronger day by day; in fact, in all that pertains to business matters, the west is to-day more in sympathy with the south than with the east. Indeed, a coalition between these sections, for the purpose of securing political and commercial domination of the country, is openly talked of.

This condition of things has come about through the apathy and lack of combined action on the part of our business

men to assert themselves and fight for their material interests. The same indifference on the part of property-holders regarding rapid transit served to build up the neighboring towns in New Jersey and on Long Island at the expense of the upper part of this city. Now that the evil is done, our capitalists have awakened, and rapid transit is secured. This may serve to retain what is left of our population and to secure the increase in the future, but the loss we have sustained is irreparable, for our neighbors will also retain what they have got. So with our trade and commerce. What is gone cannot be restored, but we may, by vigorous action and enterprise, retain what we still hold, and secure a goodly share of the natural increase. But what is necessary to do this is for New York to own its own line of European steamers and its own trunk line of railroad to the west, and to maintain by these means a competition with other lines that cannot fail to give us our share of the European and western trade. Better facilities must also be provided for the trans-shipment of freight at this port. In this particular, all the seaports named have an advantage over us, both as to time and cost. Provided as we are with two magnificent rivers and the grandest harbor in the world, very little ingenuity is required to make our terminal facilities superior to those of any city, either at home or abroad. But first we must have the will to do it, and that is what is woefully lacking.

The condition of things we have set forth affects the jewelry interest in that whatever affects the business prosperity of New York is immediately felt by our trade. No business either in its manufacturing, jobbing or retail phases, is more keenly sensitive to fluctuations of trade in general than the jewelry business. It is the first to feel the shock of a coming storm, and the last to recover from it. Stagnation has been its prominent characteristic for several years, and this, in part, is due to the loss of commercial prestige which New York has suffered in that time. Then, too, the west has established its rival manufacturers in the jewelry line as well as in other branches of trade, who are pressing their sales even into our very midst, competing on our own territory for the trade which has been ours for all time. Offers are made to still other manufacturers to "go west," and liberal inducements held out if they will remove their factories and their men to the valley of the Mississippi. The jewelry interest has as much at stake in maintaining the supremacy of New York as the commercial center of the country as any other, and should take its part with other branches of trade in all efforts to secure that end. The situation is such that all business men feel its demoralizing influences, but we feel that too few have a just appreciation of its dangers. It is high time that New Yorkers shook off their indifference and vigorously sought to counteract those insidious influences that are at work undermining our prosperity, and over-clouding our future prospects.

Illegitimate Competition.

WE are in receipt of a number of letters in reply to our article published last month, asking for "voices from the people." Most of these come from members of the retail trade throughout the country, expressing opinions with regard to advertising of watches as newspaper premiums, and the publication of trade circulars to the outside world. The retailers feel that their trade is injured by the action of those houses who are assisting the newspapers to undercut their own customers. Almost every week some country jeweler gives up business, and much of the trouble is not owing to the hard times. The fact is that certain dealers are so eager to push sales that they will sell to anyone who will buy. A few years ago the jewelry business was confined to jewelers almost exclusively; to-day every dry goods store keeps its line of jewelry, every grocery and crockery store its stock of castors and hollow-ware, and every hardware store its assortment of silver spoons, knives and forks, while any number of newspapers advertise watches and jewelry as premiums. Is it any wonder that jewelers have to suspend when contending with such an amount of illegitimate competition? And do the manufacturers gain anything by it in the end? If things go on five years more at the present rate, country jewelers will have ceased to exist save as repairers; and manufacturers will find out too late that their trade has been ruined. Moreover, these premium watches possess an advantage over the identical goods when offered in the store of a retail dealer, as a personal certificate of warranty is given, which goes further than any jeweler's guaranty. The stand taken by the Waltham, Springfield, Howard and Hampden Companies has met with the approval of the trade, which feel that these companies understand the mutual interests of manufacturer and dealer, and are disposed to protect them.

Evils of this kind can best be remedied by combined action of the trade; and if something of this kind is not done, the retailers will be obliged to help themselves by refusing their advertising patronage to those newspapers who publish premium advertisements infringing on their trade. This has already been done in some cases with beneficial results; and although we do not admire the principle, we cannot but make allowances for people who have been, as it were, driven to the wall.

Character, Capacity and Capital.

THE trade have had little else to do during the past month than attend creditors' meetings and investigate the affairs of bankrupt merchants. The failures which have lately occupied their attention are nothing more than a reasonable outgrowth of the workings of small capital, large operations, underselling and over-competition. Messrs. Hamann & Koch have suspended to the tune of $60,000, an amount of credit they never should have obtained. The backing and standing of the firm were not such as to justify such confidence, and we are astonished to see that they now pretend to show $40,000 assets and offer fifty cents on the dollar. Their affairs have been placed in the hands of the assignee appointed by the creditors, with instructions to close up the business. Messrs. Hamilton, Rowe & Co. are also in the field, clamoring for their creditors to let up on them. This firm have shown themselves able to conduct a business nearer cost than many of their neighbors, and the natural consequence is an offer of fifty cents on the dollar, which has, under the circumstances, been declined.

On the other hand the sympathy of the trade is expressed for Mr. Herman, the well-known diamond merchant, of this city, who, after twenty-five years of active business life, has been obliged to suspend in consequence of the pressure of his creditors. There is every reason to believe that in this case the creditors will get their full due, as the assets are valued at some six thousand dollars more than the liabilities. It would appear that Mr. Herman desired to protect the bulk of his creditors against the few who are crowding him, and his is evidently a case which should be adjusted with leniency.

F. M. Herron, of Indianapolis, is also in town, engineering a settlement, and a majority of his creditors are disposed to be easy.

When will manufacturers learn to investigate credit, to refuse to countenance underselling, and to enforce to the full their rights in cases of compromise? One lesson after another seems to have no effect whatever, for the same old story is told and retold time after time: first a man overstrains his credit, then he undersells his competitors, and then he compromises, frequently having a little money in hand with which to start again. In order to secure success in business the merchant should be possessed of character, capacity and capital; he may get along in a way without some one of these qualifications, but the absence is always dangerous. Thus your competent man of character, with the best intentions in the world, often finds himself hampered by the lack of capital, and may, some fine day, be pushed to the wall to the detriment of those who trusted him. Your well-meaning capitalist, who does business in a happy-go-lucky style, thinking everybody as honest as himself, is sure to wind up before a board of sympathizing creditors, who accept his composition, making at the same time mental memoranda that they

have had enough of that man. Lastly, comes the man of some capital and capacity, but without character. This man is dangerous —in fact the most dangerous of all who prey upon the trade. He makes his capital appear larger than it is, and so, little by little, he overbuilds his business until he either becomes a millionaire, or, having failed in some reckless speculation, brings down a multitude of smaller merchants. As for the man who possesses only one of these qualifications, he has no business whatever in trade. The world has had most sympathy for the incompetent man, who fails because he cannot help himself; people are apt to say, "poor fellow; he has lost everything, and we must not be hard upon him." But there is a feeling throughout the trade just now that this kindness has been carried too far, and for the future incompetent debtors are likely to be classed next to criminal ones. This may be hard, but it is for the benefit of all. Your "good fellow" is terribly dangerous; with him you are off your guard. You are disposed to grant him favors, and you are apt to take excuses instead of payment. It is different with the sharp customer. Hence, we think it will be for the benefit of the trade at large if men whose incapacity is their offence, are in the future ranked with those whose want of character has served as their stock in trade.

Moral:—"Little ships should keep in shore; big ships may venture more."

It is stated on good authority that Whitby, in Yorkshire, derives a revenue of not less than $250,000 a year from jet. Sometimes the receipts have been nearly double that sum. They vary with the caprice of fashion.

We hasten to correct the omission of the American Clock Co. from the list of exhibitors at the Paris Exhibition. This well-known firm will represent the important clock-making industry of this country, as it is admitted that they are at the head of this branch of industry.

Since the close of the Centennial Exhibition our trade with Australia has increased to such an extent that a vast number of merchants in Melbourne, Sydney, and other large cities are anxious to send remittances at frequent intervals to this country. The Government of Australia has made proposals to the United States looking to the establishment of an international money order system.

We are in receipt of "The Jeweler and Metalworker Almanac, Diary and Directory for 1878," published by Wm. Allen, of London, which contains much valuable information as to the Hall-marking regulations, many valuable practical recipes, and a classified directory of the trade throughout England, which last will be very valuable to the merchants and manufacturers of this country, as reference.

We are requested by a correspondent to call the attention of the trade to a "Patent Improved Engraving Machine," which has been extensively offered to jewelers. We are informed on good authority that this machine does not fulfill the promises made for it by its vendors. In time a passable piece of coarse work on a flat surface can be effected by it, but it is useless for fine work, and wholly impractical and worthless for general use.

Mr. J. H. Johnston, the well known jeweler of this city is always picking up fine and odd things, and now has on exhibition a seven carat diamond without a blemish of any kind, and tinged slightly with steel blue, that rarest of all colors, which makes perfectly white stones appear off color beside it. This stone has been examined extensively by the experts of the trade, and has been pronounced one of the finest if not the most incomparable in this country. It is held at $15,000, but is a good investment for any one desiring to own the choicest of stones.

Mr. Olmsted, who some time ago retired from the firm of Taylor, Olmsted & Taylor in consequence of ill health, has been elected to the position of Secretary of the Jewelers' Association. Now that the up-town and down-town societies have amalgamated he will find a fitting sphere for his exertions; and no more honest, competent and in every way correct gentlemen could have been found to fill the position than Mr. Olmsted. He is a thorough man of business and has a large experience and an extended acquaintance in the trade, which fits him for the posttion; he understands the requirements and condition of the trade, and has a thorough idea of the proper relations and duties of debtor and creditor; and, while kindly disposed toward those whose misfortunes in business are the result of circumstances beyond their control, his strict probity is unyielding in all matters of fraud and crookedness. We are glad to know that the gentlemen is restored to health and fully able to discharge the duties of the office to which he has been elected.

Sea Beans.

QUITE an important industry has lately sprung up in Florida in the preparation and mounting, as watch charms, sleeve buttons, ear drops, etc., what are commonly known as Florida sea beans. At St. Augustine the United States Government has a sea bean factory, where a large number of Indian prisoners are employed polishing these pretty and curious products—of the sea, it is popularly supposed. "I can get no clew to their origin," said an intelligent Florida tourist the other day. "They are said to come from the sea. Do they grow there?" Another gentlemen, who had been connected with a popular winter resort in Nassau, was quite positive that they were a marine product. The encyclopædias are silent with regard to them. Tourists and tourists books, guide books and similar sources of information fail to explain their origin. They are for sale in all the fancy stores and notion shops, and at all the street corners by curbstone dealers in cheap jewelry. Everybody knows what they are; but all that is popularly known about their origin is that they are picked up along the Florida beaches after storms, and that large quantities of them are brought from the Bahamas, where they are likewise washed up from the sea.

On splitting one open it was at once apparent that it could not have grown in the sea; no marine plant bears dicotyledonous seeds. It was clearly a bean of some sort, and if they did not grow along the beaches where or near where they are picked up, they must have grown elsewhere, and possibly may have been floated by the Gulf Stream from the South. Thither we sought for them; and to save other laborers the trouble of identifying them we will say that after much research we were able to trace them to their native soil.

They are well known in the West Indies, where they are variously called from their appearance ox eyes and asses' eyes. The earliest description of them and the tree which bears them appears in the second volume of the "Natural History of Jamaica," by Hans Sloane. The tree was abundantly found by him on low ground "by the river's side under the town and on the Red Hills very plentifully." His description of the tree, which he calls *Cytissus arboreus*, is quaint enough: "This tree has several trunks, each as large as one man's leg, rising together, covered with smooth cinnamon colored bark, straight, eight or nine feet high, the branches rising upright, all round about beset with leaves coming out at an inch's interval, three always together, all taking their origin at the end of an inch long, green, common footstalk," and so to the end without a stop.

There appear to be several allied trees bearing the different beans sold under the common name. Linnæus describes the ox eye tree as *Dolichos urens*. De Candolle's name is *Mucena urens*. In his splendid "Flora des Antilles," De Tussæ figures life size and beautifully colored the stem, leaf, flower, and fruit pod of the tree which yields the larger and handsomer beans, and describes the tree as *Negretia urens*. In many parts of the West Indies the superstitious carry ox eyes in their pockets, as like classes here carry buck eyes or horse chestnuts, and for the same purpose.

Foreign Notes.

The latest novelty in pottery in France is a rough earthenware, in imitation of that in use during the sixteenth and seventeeth centuries. It is made at St. Clement's, in Lorraine, and is of a coarse, red body, covered with an opaque bluish enamel. It is chiefly decorated in the renaissance and early seventeenth century, and the pieces already produced consist of inkstands, bon-bon boxes, and vases of grotesque shapes, such as umbrellas, baskets, etc.

Mr. E. J. Watherson, the most active representative of the silver trade in London, etc., has, through the intervention of the Society of Arts, placed a sum of money at the disposal of the council for the promotion of artistic composition by the designers who identify themselves with the handicraft of the silversmiths. The other day a deputation of watch case makers waited upon Sir Charles Adderley, the President of the Board of Trade, in support of an inquiry of a system of Hall-marking of gold and silver. The motion in the House of Commons will be brought forward by Sir Henry Jackson, M. P.

The Royal Observatory at Greenwich now takes note of the number of hours of sunshine daily enjoyed by the Londoners, using for the purpose Campbells registering sun-dial, a sphere of glass four inches in diameter, supported concentrically within a hemispherical bowl in such a manner that the image of the sun formed when the sun shines falls always on the concave surface of the bowl. On this concave surface is laid a strip of card board, held in position by suitable clamping pieces, on which the image of the sun is received, and whenever the sun shines brightly the cardboard becomes discolored or blackened or altogether burnt through. The position of the meridian is marked on the card before removing it from the bowl, and time scales of different lengths having been prepared, the one suitable for the particular day is employed to mark the scale of hours on the record.

The English crown diamonds have arrived at the Paris Exposition, and are valued at $8,5000,000. They are in a thick iron chest and are guarded by sentinels day and night. There is a diadem of eighty-six diamonds of various sizes, in the middle of which is the Koh-i-noor, alone valued at $320,000, also a collar of 108 diamonds, in the centre of which is an emerald, said to be the purest and most beautiful extant. A second diadem is a blending of diamonds and emeralds. In the centre is the large Kaudavassy diamond, valued at $600,000. It would be rated at a higher sum were it not for a slight defect. These, and many other valuables of the kind, belong to the English crown. A portion are used by the Princess of Wales on special occasions; the others are reserved for the Queen. The Kaudavassy was formerly the eye of a one-eyed Hindoo deity, and has been but lately added to the collection.

The Largest Sapphire in the World.—Lady Rosebery will be the fortunate possessor of what is believed to be the largest sapphire in the world. Her Majesty the Queen, the Czar, and the Duke of Brunswick, are supposed, one or other of them, to possess the largest diamond in the world, while the Duke of Westminster owns the biggest turquoise, for which, by the way, he is said to have paid £2,000 some years ago. The history of the Rosebery sapphire is somewhat curious. Some time ago it was brought to England in its rough state, but owing to an imaginary flaw, which was supposed to be in it, the dealers fought shy of it, and it remained unsold for a long time until at last a certain broker seeing it, made up his mind to run the risk, and bought it for £800, taking all the risk. The lucky purchaser's estimate of the value of the stone turned out to be correct, as, when it was sent to be polished, it was discovered that the supposed flaw was something in the nature of a trivial scratch, and only skin deep. Whether it passed through other hands or not before it was finally purchased by the youthful hope of the Liberal party in the House of Lords we know not; but it ultimately became the property of his lordship, who presented it along with many other jewels to his *fiancée*, Miss Rothschild.

"Scarf pins," says the *British Jeweler and Metalworker*, "are taking the place of rings, and are remarkable for the quaint conceits displayed in the styles of this season; for example there is a little *fac-simile* of a cuckoo clock, with hanging pendulum; a cat is creeping over the top; a tiny sailor stands at the wheel; a cat's head with a mouse in the mouth; a disabled jockey; dog collars, whips, dice, swords, and many other devices; a skull with a black mask hanging before it like a veil; a gold Japanese fan with a stork and rushes engraved upon the flat gold surface; moonstones with attachments of crescents set in sapphires and diamonds. These are all richly enamelled in brilliant colors, and many of them set with precious stones."

A hydro-pneumatic clock, devised by M. Bourdon, has been reported on favorably to the French Society of Encouragement. The motor recalls, in some measure, the principle of the ancient clepsydras, and the means of communication between this organ and the clock-work movement is the circular tube with flattened elliptical section, which M. Bourdon has already treated in various ways. The motive agent is essentially atmospheric pressure, acting by reason of a certain degree of vacuum produced by means of the trompe of laboratories (of improved form). A first reservoir may be filled by hand at intervals; or, it may be a cistern fed by rains or otherwise, in which case the flow may be considered as indefinite. This dispensing with the necessity of winding is one advantage, and should be specially useful in meteorological observations. Again, a single motor may, with ease, be arranged to actuate a number of clocks distributed throughout one edifice, or in the neighborhood—the tube from the trompe being made to give off branches.

The Goldsmiths' Company have issued their usual yearly notice of prizes, the first prize of £50 for the best design, and £50 for the best model of some article in gold and silver, which, when manufactured, shall exceed thirty ounces in weight; a prize of £25 for the best execution and workmanship of some such article; three prizes £25 each for the best design, model and execution of some article of less weight than thirty ounces; and prizes of £25 each for the best specimens of chasing or *repoussé* work and engraving. Objects of jewelry and personal ornament are not to be the subjects of design. All the specimens sent in will probably afterwards be publicly exhibited. The competitors must be British subjects, and the objects must be delivered before November next. The company have also resolved that a traveling scholarship of £100 per annum may be awarded to a student who has shown exceptional talent, and who shall have obtained a prize for design for three successive years, in order to enable him to study art in the precious metals on the Continent.

A Change of Base.

B. Kahn & Co. will remove to 32 Maiden Lane.

W. Cohen has removed from 8 Maiden Lane to 441 Broadway.

May & Stern will remove from 20 to 19 John street about May 1st.

Tingley, Sinnock & Sherrill have removed from No. 9 to No. 5 Maiden Lane.

Habermeir & Wiederer have removed from 181 Broadway to 23 John street.

Downey & Smith will remove about May 1st., from 71 Nassau street to 24 John street.

Sexton & Cole will remove from their old stand, 61 Nassau street, to 30 Maiden Lane.

J. Eugene Robert will remove from 9 Bond street to 30 Maiden Lane, about May 1st.

W. C. Greene & Co., will remove from 18 John street to 192 Broadway, corner John street.

R. J. Herbert will remove from 2 Maiden Lane to 24 John street, in the office with J. Weinhold.

Krementz & Co., manufacturing jewelers, of Newark, N. J., have opened an office at 13 John street.

Aikin, Lambert & Co. will remove about May 1st, from 16 to the store formerly occupied by Alex. M. Hays & Co., 23 Maiden Lane.

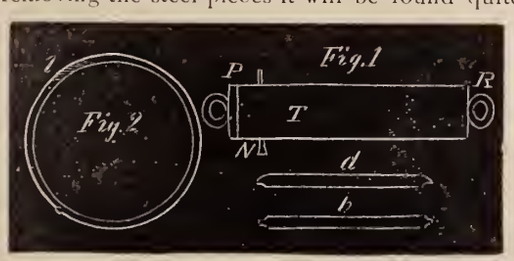
The Hampden Watch Co. will remove, May 1st, from 12 John street to 12 Maiden Lane, in the office of Courvoisier, Wilcox & Co.

Engraving.

BY AN EXPERT.

THE art of cutting steel stamps is one which, if well understood, would come into frequent use if the process was better understood, and with many time might be employed profitably. The art does not simply apply to the cutting of mere letters and figures, but can be extended to the various dies and punches which the jewelers and watchmakers require in their work. The first essential is to prepare the steel for the work; pieces of old files furnish an abundant supply of the very best material. Procure two or three pieces of wrought iron tube, say one inch, one and one-half inch, and two inches in diameter; have one end closed by having a plug of iron welded in, any blacksmith can do this. Next have a loose plug fitted to the open end. The closed end should have a loop or ring attached so as to lift or remove it readily from the fire, and also to hold it over the bath when hardening, as will be explained further on. The closing or loose plug can well be made of cast iron and the loop can be made of No. 8 wire, and a hole drilled, and the loop tapped in with a screw. We have our annealing box now, with one end closed; we will now proceed to use it. Select such pieces of steel as you wish to render soft, next pulverize some charcoal; this is best, or, rather, quickest, done with a large tin grater. Fill in a layer of charcoal dust into the box, then put in some of your steel. If the steel pieces are large all that is necessary is to pack them so that they will nowhere touch the box, but be surrounded on all sides by the charcoal dust. After the box is nearly full of fine coal and steel pieces, strike it lightly on the side with something like a light hammer, or a good sized piece of wire; this ensures the coal dust filling in all the spaces between the pieces of steel. Fill the box as full of coal dust as will admit of the loose stop being inserted. A hole drilled through the end of the box, at right angles to its axis and passing through the plug, is a good plan. Into this a common six or eight penny finishing nail can be inserted, and it will prevent the plug being displaced before you are ready. The plug should be puttied or plastered into the tube with fire clay, or, in the absence of fire clay, common red brick pulverized and mixed with a very little (say 6 or 8 per cent.) of whiting. The lute or plastering should be quite dry before it goes into the annealing furnace.

A common coal stove serves every purpose for annealing, only the fuel used must be charcoal, and the draft so managed that the box is *heated very gradually and maintained at a pale red heat for two or three hours.* On removal of the iron box from the fire it should be instantly covered with *hot* wood or coal ashes. It is quite essential that the ashes should be hot, and this can readily be done by heating in an iron pan or pot. The slow cooling of the annealing box with its contents is the vital principle of the process. It will take five or six hours for the box to cool off, and when this is effected, on removal of the loose stopper, it will be found that none of the fine charcoal has been destroyed (burned) for the reason that no air can get to it. On removing the steel pieces it will be found quite white, no



scale (even a piece of blued steel will come out white), and softer than ordinary iron. Such annealed steel is invaluable to persons working steel, and a file cuts it with astonishing readiness; a common graver can be used to cut line after line on it without being unsharpened—indeed, no watchmaker or jeweler after once using steel prepared in this way will be without it; and a two inch box will prepare enough, at one operation, for a year's ordinary use.

Frasses or mills for cutting engines can be made of this steel and cut with the common graver. The process is very simple: take a piece of your softened steel, turn it up into the shape of the tooth you wish to cut, and then cut lines as shown at *l*, Fig. 2. The lines should be as close (side by side) as possible; if they are not exactly regular it is of no importance, as the cutters or *frasses* will do their work when on the arbor in the engine, and wear astonishingly. These cutters are admirably adapted for stem-winding wheels, and the wheels themselves should be made of the same softened steel, and, after finishing, hardened by the process to be hereafter described. Small files of peculiar shape can readily be cut in this manner. After the steel has been softened as described, the cutting is commenced by laying out the letters on the level face of the stamp; this is as well done with a pen and common writing ink as anything else. A center punch prick is made at all points to be drilled such as the loop of B's, and two pricks made for C and O; these are to be drilled as deep as two or three diameters of the hole. The corners on the straight side can be cut with a lozenge graver and the final shape given with a punch of exactly the right size and shape. The main features of the letters or design must be made out first, and then the burs must be kept off with a fine file or a slip of Arkansas stone. It is well to cut across the face of the stamp with a screw head file, between each letter, before stoning off the ink tracing. If the letters are Roman it is a good plan to cut with a lozenge shaped graver around the whole letter, leaving the letter as near an edge as possible, that is, with no heavy parts; this is the better way, as it takes too much force to indent a wide surface. The angles of the letters do not want to be sharp, that is, the cutting angle of the letter should be about 60° or like the angle of a thin square file. In monograms and similar punches the best way to proceed is to cut around the setters with a graver of 60° angle and do the surrounding lines deep and well defined, so that when the surface is stoned off the letters of the design stand sharp and clear and present a surface only of hair line. Now go at it to remove the superfluous surface by dulling away as much as possible; this must be performed carefully, and if you find your drill is going to cut over the line change it for a smaller one. The drill must be used as much as possible as it is by far the safest and most rapid means of removal of the surperfluous steel we have. After the drilling is done stone off the burr, and if desirable, drill out some more of the surface to be removed; but it must be borne in mind that every time the face of the stamp is stoned it widens the surface of the letter, which is not desirable. For this reason it is best to stone off the burr as seldom as possible. After the dulling is complete a few small cold chisels, of different widths, with a cutting edge as thin as will stand, soon completes the job; the chisels can be applied directly in the line formed by the graver. If the drilling was performed judiciously the chiseling will be easily performed. In wide spaces if the holes are close enough there can be a good sized punch applied, and the whole surface crushed down with blows from a hammer. After the die or punch is complete an impression can be taken on sheet lead, or any lead, flattened on a level smooth-faced stake, if the impression is satisfactory the punch is to be hardened; this can be done in several different ways, but it is desirable that the letters should not scale with the heat. To prevent this, same workmen smear castile soap over it before heating; besides this, most of our material dealers sell preparations for protecting metals from oxidizing, but the best method, especially for brasses or dies, is the same charcoal box used in the process of softening. The work is packed in charcoal dust precisely as before, only the heating need not be continued so long, in fact only long enough to be sure that the die is red hot. The box is now removed from the fire and the loose plug *P*, and by the ring *R*, the tube *T* is held over water or cold oil; it should be held within an inch or two of the surface, and struck with an iron wire about the size of a common lead pencil when the red hot coal dust and article or articles to be hardened will fall into the bath, the shower of coal dust effectually protecting the die from oxidization. Of course the work will be too hard to stand well and should be reduced to a dark brown approaching the purple, or onion color as some call it.

Proceedings of the Horological Club.

A Distinguished Body of Watch and Clock Makers.

Forty-ninth Discussion.—Communicated by the Secretary.

Secretary of Horological Club:

I feel interested in the different communications in regard to the botches and the almanac remedy, and think it to the interest of the craft to hear from all parts of the country on subjects pertaining to the trade. I think the almanacs would be an advantage, but it would be impossible to prevent the botches from getting them. I do not think Mr. H.'s plan would work in all cases; but if the almanac contained, besides the instructions about the care of a watch, how it should be handled, how often cleaned, to make it durable, also the importance of having it properly repaired, for any watchmaker knows that there are almost as many watches ruined by poor workmen as by ging carried, and, although there may be a small difference in the rges of a good workman and a poor one, that economy is always the side of good work, more particularly in a watch than anything. Also describe the manner and kind of work, and the injury done watch by a poor workman, in such a way that he could see himself so plainly pictured out that it would be like advertising his own funeral for him to distribute them.

But what I wish to speak about more particularly, and what is far more injurious to the trade, is the course of some of the wholesale houses of Chicago and several other places. The botch is no disadvantage to the good workman in a pecuniary sense, for his work generally has to be done over again by some one who knows how, and he can always get a better price for it. I will admit that no good workman likes to get a watch to repair that has gone through the hands of a first class botch, because it is impossible to make a neat job of it, or one that is liable to give satisfaction, at a price within the limit that the owner would like to pay. But he must explain it in such a way that he will be a little more careful who he gets to fix his watch the next time. But to return to the wholesale houses who send their catalogue to every peanut stand in the country. The only object they can have is to get to retail a watch now and then. It would not make any difference if their catalogues did not contain the different American Watch Companies' lists, with the discounts, as the general public know nothing about their jewelry, but they do know that the American made watches, as a general thing, are reliable. And a great many people are not willing that the dealer should make a profit in their particular case, especially if they happen to know the wholesale price. The manufacturers might as well sell their watches direct to the retail dealer who comes into direct communication with the carrier of the watch, and therefore would take an interest in having the watch give satisfaction, which would be to the interest of the manufacturer as well as the dealer. I think that if the watch companies continue to furnish their watches to nick-nac and novelty dealers, prize package associations and as newspaper chromos, to be peddled over the country and advertised for retail at wholesale prices, the reliable dealers should take the matter in hand and refuse to handle any watch company's goods that continues to do it. To keep up the reputation of the American watches no one will deny that it is necessary to have them sold and kept in repair by reliable retail dealers and watchmakers. I think there are enough of the latter class in this country, if they would unite, in case the watch companies continued to furnish any body with their goods in preference to the retail dealer, to establish a factory and have their own watches made, for their special trade exclusively. It makes no difference where a watch is made; if a dealer is reliable he can sell any watch that he will recommend and back up. I am not finding fault with the plan of furnishing their goods only through the regular jobber, for I think that is the best way; but I think that it is in the power of the watch companies to make a change for the better in this matter. I would like to hear the opinion of others on this subject.

Yours respectfully, R. E. Tail.

Mr. Clerkenwell agreed with the writer that the companies which followed the practice of furnishing their watches to parties outside of the trade, at wholesale prices, should be ignored by dealers entirely. This would very quickly bring them to a realizing sense of duty to the trade. But the trouble was that the damage was already completed, by wholesale houses sending the prices of American watches to everybody. There was hardly a farmer or tradesmen in the country who did not know all about the wholesale prices, and it had come to such a pass that a jeweler had hard work to make anything at all on an American watch, and a great many had ceased to keep them. It would not be necessary to establish a factory, as they should adopt some make of imported watches for their trade.

Mr. Waltham said that not all of the watch companies were guilty of the practice referred to, and dealers should patronize those makers who pursued a strictly honorable course in protecting the interests of the trade. He thought that dealers laid themselves open to the difficulty by putting too much stress on the precise price for each grade of movement, and each style and weight of case. That was not at all necessary, but led customers to be too critical and too well posted. He thought a better way would be to put their movements in suitable cases, and put a fair price on each *watch*. the same as they would on an imported watch. No one ever thought of demanding the exact weight of the case of an imported watch, or the precise cost of that particular quality of movement. They understood that the better the works and heavier the case, the more they must pay for it. So it should be with American watches. Ignore the grade and the weights, and make the prices according to the value of the article. Offer a customer a cheap watch, a good one, or a fine one, just as he wanted, and let him pay according to the quality. He thought it would not be difficult to get the public accustomed to this way of buying watches, which was the way they used to do. It would be impossible to keep the "wreckers" from getting the watches, but by following the above course dealers could draw their teeth, as it were, and take away in a great measure their power to harm the legitimate trade.

HARD SOLDERING STONE SET RINGS.—WATCHES AS PREMIUMS.

Secretary of Horological Club:

You ask for a fuller expression from the retail trade, and therefore perhaps a word from me will not be out of place. First, for the benefit of W. S. (although undoubtedly old to the trade), I will give my process of hard soldering stone set rings when broken at the lower side. Take tissue paper and tear it into strips about three inches wide, twist them into ropes, and then make them very wet and wrap the stone with them, passing around the stone and through the ring until the centre of the ring is a little more than half full of paper, always winding very close, and then fasten upon charcoal, allowing the stone to project over the edge of the charcoal, and solder very quickly. The paper will prevent oxidation upon the part of the ring it covers, as well as protect the stone. For most work I like this process better than that described by Mr. Rolliver.

And now a word with regard to the furnishing of watches as publication premiums, or to patent medicine venders, dry goods and grocery houses. It can be broken up by the retail trade if each one will do his part. I have sold the national Elgin watches almost exclusively for the past eight years, but as soon as what I have on hand are disposed of I shall cease selling them entirely, for there are equally as good watches, if not better, made by companies who refuse to sell to any but the legitimate trade. It is to the retailers that the Elgin watches are indebted for a larger portion of the reputation they have had. I shall refuse hereafter to sell them, and let them manufacture for newspapers, if they wish to. J.

Mr. Blowpipe replied that Mr. J.'s method would no doubt work well. Another way, followed by many workmen, was to mix plaster of paris and water to the consistency of cream, and pour it around the stone. It would set in a minute or two, and form a perfect protection from the heat. But either way would take more time to get ready for soldering than would Mr. Rolliver's method. As that gentleman was not present he would remark that Mr. R. was one of the oldest and leading jewelry makers and jobbers in the city. With such men time is important, and the way they settle on, as the result of their experience, may be considered as the one which, in their hands at least, is the quickest and safest for them to follow. But other ways may be better suited for others, and we are always glad to hear of all the different ways of doing work, and let our readers choose which they prefer.

With regard to the whole sale "wreckers," Mr. Blowpipe thought that any Company must be out of their senses to insult and misuse their principal customers, the retail trade, for the sake of working off a few hundred watches on outside speculators, whether they

were newspapers or any other concerns. But Mr. J. had suggested the true remedy. He would add to it the further suggestion that any company which had been guilty of this practice should be ostracised *for good*, and not be allowed to repent after making all they could out of it, and be received in favor again. If dealers had any feeling or spunk at all they would never forgive or patronize any concern that worked against them and practically slapped their faces.

REMOVING MAGNETISM FROM WATCHES.

Secretary Horological Club:

I see that a greal deal of valuable information is given through the Proceedings of the Horological Club, but have never seen any reference to steel charged with magnetism, and will be pleased if some member or correspondent will explain the best method of removing magnetism from the balance hairspring or lever. R. J. S.

Mr. S. will find that the subject has been fully discussed by the Club, and all that is known about it described, in our Proceedings, published in the JEWELERS' CIRCULAR for July, 1875, and June, 1876, also in the Appendix to "Excelsior's" book.

MR. PIAGET'S BOOK ON "THE WATCH."

Mr. Piaget, a well-known watchmaker of this city, has recently published a new edition of his pamphlet on *The Watch; or, Hand Work versus Machinery*, a copy of which he kindly presented to the Club. He goes into the controversy as to the respective merits of hand made and machine made watches—very naturally giving the preference to the former. This is a question about which the Club, like the rest of the trade, is divided in opinion, Mr. Waltham maintaining that machinery, constructed especially for accomplishing a certain purpose, and supervised by careful and intelligent workmen, could and would do that particular class of work better than it was possible to do by hand. He also said that the reason why the more complicated kinds of watches were not made by the American factories was, not from any inherent difficulty in doing so,—for they could be as easily and perfectly manufactured by machinery as any other,—but simply because the number wanted of any one kind was so limited that it would not pay to fit up machinery especially for making them, and employ a large number of workmen trained for that class of watches. The pamphlet is well printed, and entertaining reading, and contains many good points and hints, both for dealers and the public. It can be purchased of the author, as advertised in the CIRCULAR. The Club will be pleased to receive copies of any works relating to our trades, for addition to its library, and, if desired, for discussion by the the members, as well as new tools and improvements.

FITTING A BEACH CHUCK ON LATHE SPINDLE.

Secretary Horological Club:

In the December Club Mr. Horologer tell us how to fit a Beach chuck to a lathe spindle. We ordinaries expect and usually *get* accuracy from Mr. H.; but he says, "grind with emery," and "replace very nearly true as before." As the usefulness of a chuck depends largely upon its accuracy, I ask liberty to describe another method. Of all ways, C. W. C.'s, of an extra spindle with chuck fitted permanently, is the best, but as many prefer one spindle only, we employ other means. A chuck, to be held in position well, should have as long a bearing as possible. As, for our work, it must be compact, it is difficult to get this crossways. The best way to get it lengthways of spindle is by a taper hole in spindle, and chuck fitted permanently on a well fitting taper arbor, which can be done if the lathe spindle has such hole in it, or is large enough to admit of it. The hole should be as long and large as possible without weakening or springing the spindle, and the taper about 3° from parallel, should be drilled, then reamed slowly with a very sharp, true, fluted, taper rimmer. Absolute truth of the hole with the spindle is not indispensable, though desirable. The chuck is supposed to be true in all its parts. Now, take a piece of octagon tool steel, only large enough to admit of necessary manipulation. Never take large steel for small tools, as they are not as good when finished. Anneal it by any well known method. Centre it to turn in lathe with the head and tail made centres. See that it fits with both countersinks, and has a small hole drilled in below to bottoms of countersinks, then the centres will not get out of shape while turning. Next turn off a chip over the whole length, by using screw dog to hold it, and changing ends of piece, then turn the outside end near to size, dog that end and turn taper near to size. This can be best done with a slide rest, but can also be done by handtooling. If it was a large arbor I should now say anneal again before finishing, as steel often changes form by reducing, but for this it probably will not matter. Never take to size by first chip, as it will not be true; the last chip should be fine. Now work carefully and turn the taper to fit spindle. After there is no perceptible shake take a piece of chalk in finger and thumb, with the second finger resting on taper, hold arbor in left hand and draw a straight mark the whole length, with quick, even stroke. Place arbor in lathe spindle and turn *once* around, then, by looking at the chalk mark, you can see just where it hits, and reduce to fit the whole length, using a fine sharp file for last finish, and you will have a fit not hard to place or remove, and one that will *hold*. Use no emery on the inside of lathe spindle under any circumstances; use no more than you are obliged to around a good lathe, as it will bed in soft steel or brass, forming a vexatious "lap," sometimes doing much damage unsuspected. To use a file on round work, run your lathe at fast speed and move your file with slow even stroke, or you will have "flat spots." Always turn near to size, and use a file no more than necessary on any work. Now wipe arbor clean and put it in the spindle, tap it home snug enough to hold good in all work (don't drive it on too hard or you will never move it again), then prick-punch a dot on nose of spindle and on arbor, so as to replace same side up. This is important if the hole is not true with the spindle. Next turn the nose of your arbor so as to fit the chuck permanently, and with care, as the chuck has a short bearing. Avoid emery if you can, though not now so important, as not intended to remove or replace; I can fit it as well without emery. A square end scraper is best for many good fits, but wants experience to use properly. It is a good plan to leave a little extra size and room between chuck and lathe spindle, then in case of accident the arbor can be trued up without making a new one. Drive your arbor out by a key way in spindle at inside end of arbor, or by a wedge key used between nose of spindle and shoulder of *arbor*. If used against the chuck it might drive it off its arbor. To test the chuck after placing, turn a piece exactly parallel, with true pointed centre, then shut the chuck on the parallel sides, and see if point runs true. This piece should be of such size that the jaws will not be out to the full extent, so that the jaws can have good bearing inside the chuck. The longer the piece is the better to test with if *known* to be accurate. If from any cause whatever the hole in back of chuck is "out of true," and the rest of the chuck is all right, make an arbor with both centers female, as large as can run through the chuck and leave room to cut, with parallel spot to shut the jaws on, not too far open, screw the chuck on to it firmly, place in a good stiff lathe and turn out back, bearing true with proper tools; or, if no hole through chuck, screw to a short stiff parallel plug in a lathe. There are other tests and means for extreme accuracy, impracticable for the general workman. If taper hole cannot be used, and lathe spindle has screw thread on outside or inside, make an arbor or collet to fit thread and fasten it permanently to chuck. But in that case make front face of spindle and shoulder of collet the true parts, and do not trust to a good fit of the screw threads. They should always be screwed up to the same spot, firmly, and with clean surfaces, carefully preserved from damage. Do not infer from the above that emery has no use except as a makeshift; for reducing, or polishing, or shaping many hard substances it is most valuable and indispensable. It is not likely to bed in *hardened* steel, but if used (as it seldom has to be) on a surface of soft steel intended for any bearing or wear, use it with something elastic, and not grind between two unyielding soft surfaces.

I have given this job in detail because the main principles of it apply to a large variety of work which is important to watchmakers, and I know it to be very little understood by many of them. No part of it is original with myself. W. B. S.

Mr. Horologer said the fact that he had drawn out so good a letter from W. B. S. was sufficient compensation for being corrected. But he thought that Mr. S. did not fully understand his directions. When he said "it could be replaced very nearly true as before," he had referred to perfect *exactness* not being attainable when removing and replacing chucks, which he thought Mr. S. would readily concede. They could, however, be replaced very closely if fitted carefully as Mr. S. described. As the spindle and the Beach chuck are generally of comparatively hard steel, he did not see what objection could be raised to the use of emery flour in fitting the chuck on the outside of the spindle nose, which was what he had recommended it for. And, if mixed with oil, there would be no dust, and it could easily be used without getting it in the spindle bearings. But he thought the difference between Mr. S. and himself was more apparent than real,

and he took pleasure in commending the fullness of detail in his letter as a model for others who may describe any mechanical operation. He hoped to hear again from him, and from all who have good ways of doing work which was discussed here or which they are proficient in.

PUMP DIVIDERS.—"EXCELSIOR'S" PRACTICAL HINTS.—ESCAPEMENT GAUGES, ETC.—TREATISE ON ISOCHRONIZING HAIRSPRINGS.

Mr. Isochronal reported that he had received a number of letters which "Excelsior" had turned over to him to answer, as his proxy. The first was as follows :

Secretary of the Horological Club :

I notice that "Excelsior" has appointed Mr. Isochronal as his proxy. Now I have a favor to ask of Mr. I., and that is to have him buy me a pair of "pump dividers," such as "Excelsior" alluded to in past "Hints." When he first spoke of them I applied to all of our local dealers in drawing materials, and none of them knew what they were, so I gave it up and pegged away with my common ones. D. S.

Pump dividers, often called patent dividers, have one point fixed, at the end of the handle, while the other is on a slide, moved laterally by a screw. One or both of the points can be made to project out more or less beyond the other, so as to keep the tool vertical while measuring between holes not on the same level. They are kept by nearly all large watch material houses, and is a common as well as handy tool, costing from $1.50 to $2.00, according to quality. "Excelsior" gives the preference to the depthing tool for measuring centre distances in watches, in all cases where accurate and close measurements are required. Anyone who has a good depthing tool can dispense with the pump dividers for such uses, although the latter is not so heavy, and is therefore easier to use and is less liable to crack jewels by careless handling or accident while measuring. They are useful for many other purposes however, especially in lathe work, where it is often necessary to measure the vertical distance between parts of different diameters, which is not easy to do with the ordinary calipers, etc. Other uses will suggest themselves to the workman possessing them.

S. T. C., W. W., "Jeweler 303," and others, ask how to obtain the back numbers of the CIRCULAR containing "Excelsior's Practical Hints on Watch Repairing." All such inquirers are referred to the Note, by "Excelsior," in the March CIRCULAR, page 28. They should apply to the publisher, D. H. Hopkinson, Esq., for either single back numbers or bound volumes. He did not know of any one who would dispose of their back numbers, but those who would do so should inform Mr. Hopkinson, who might perhaps like to get certain numbers. There was no other way to obtain the "Hints," except the first series, which Mr. Hopkinson had republished in book form, price $3.50, a work he thought that every watchmaker should possess. Correspondents inquiring for the escapement gauges, angle meter, "sizer," upright holder, etc., described by "Excelsior," are informed that they are all new, and not on the market for sale. The best way is for the workmen to study the descriptions and make these tools himself, as they cannot be got unless made to order. One correspondent says :

"I would like James F. Cole's writings, complete, on the hairspring, or some other good book on isochronizing hairsprings."

The essay of Mr. Cole on the "Isochronism of the Hairspring," will be found republished in the CIRCULAR for 1876, Vol. VII. This essay was heralded long beforehand, as sure to surpass anything on that subject ever written, and quite a sum of money was collected by subscriptions, throughout England and elsewhere, to compensate Mr. Cole for revealing the important secrets he was supposed to hold. After publication, however, there was a general feeling of disappointment and indignation at the small outcome of such great expectations, and all felt that if he really possessed any superior knowledge on that point he had been very careful to keep it to himself. Indeed it was plainly said that he had better proceed forthwith to furnish the new information which had been promised in his name, or else "step down and out." As no response had ever been made, readers could draw their own conclusions.

As to "some other good book on isochronizing hairsprings," he knew of only one, and that was "Excelsior's" first series of "Practical Hints," which Mr. Hopkinson had republished under the name of *A Practical Treatise on the Balance Spring and the Compensation Balance.* Quite a number of essays on the hairspring had been published at different times, but they were principally devoted to theoretical explanations and suppositions, with occasionally a good practical hint. He believed that he had read nearly all of them, and he did not know of a single point really valuable and worthy of adoption which was not also to be found in "Excelsior's" Treatise. This was almost exclusively practical, giving merely enough of theory to enable the workman to understand why he should do as directed. It began with making springs, and treated of fitting, adjusting for isochronism, positions and rate, making compensation balances, adjusting for heat and cold, magnetic variations, etc., being a complete epitome of all that is practical and useful in effecting all the finest adjustments of watches and chronometers. It was not enough to say that there was no other treatise on those subjects comparable with it, for completeness and value to the practical workman, but there was no other at all, so far as he knew, which gave a full, trustworthy and unbiassed series of instructions on those points in plain, intelligible language, and without any of that reservation or the most important parts, which other writers had practised when treating on the various points. A life-long experience as an adjuster made him capable, he thought, of judging of such a work, and he gave it his unqualified commendation. He hoped to be excused for his lengthy remarks, but he knew that the Club joined with him in desiring the widest circulation for this important work, which he thought no watchmaker could afford to be without, even if it cost ten times its present price.

INSERTING PIVOTS.

Secretary of Horological Club :

Would any of your learned body be kind enough to inform me the best mode of inserting a pivot. Is there any other way besides soldering them in, as it is apt to make the pivot too soft ? J. M.

Mr. McFuzee replied that the pivot should *never* be soldered in. The hole in the old pinion should be drilled in from two to four times as deep as its diameter, the plug perfectly fitted, so that a tap with the hammer will make it tight, then touch a little soldering fluid to the end of the plug (the hole having been freed from oil by cleaning out with peg wood), then insert plug and drive it in. If well fitted it will hold fast, and the bottom of the plug will soon get a little rusty in the hole and make it as firm as if part of the pinion.

MR. GOAHEAD'S REGULATOR.—ANOTHER NEW COMPENSATION PENDULUM.

Secretary of the Horological Club :

I am making a new pendulum like description given by Mr. "Goahead" in October, 1877, for my Swiss regulator. I am bothered to know the size of the main steel rod, and the thickness the zinc 27 inch tube should be in its diameter of shell ; also the size of the outside steel rods ; and, is the ball made of lead ? I have it made of lead, at any rate, and have it nickel plated. Will that make any difference ? S. T. C.

Mr. Regulator said there was probably no particular size which was obligatory. The parts should be large enough to secure firmness and stability, without being unnecessarily heavy. If Mr. "Goahead" had found any special sizes to be preferable we would be pleased to receive a description from him. The zinc tube should be enough larger than the steel rod to allow freedom of motion. Lead balls are generally used. Nickel plating would do no harm, but rather the reverse, if polished, as it would reflect off the heat rays, and the ball would be less affected by them.

Mr. J. H. B. sent in a sketch and description of a compensation pendulum invented by him, for the opinion of the Club. As the hour was late, Mr. Regulator suggested that its discussion be postponed till the next meeting, and he would take the papers home with him to examine more carefully. The Club then adjourned, leaving a few letters yet unattended to, but which will be brought up next month.

Practical Hints on Watch Repairing.

By Excelsior.—No. 37.

THE SPRING-DETENT OR CHRONOMETER ESCAPEMENT—CONTINUED.

(577) The description thus far has been mainly of the wheel and detent action of the English style, although the directions for stiffness of detent spring, etc., apply equally to the Swiss. We will now draw this action according to the Swiss construction, in which the detent is a sort of lever, called the "bascule," or pivoted detent, from being carried upon a pivoted staff or arbor. The spring for bringing it to its normal or locking position, instead of being a part of the detent itself, as in the entire or English detent, is a small hair-spring whose collet is fitted upon this arbor, and the stud is fixed

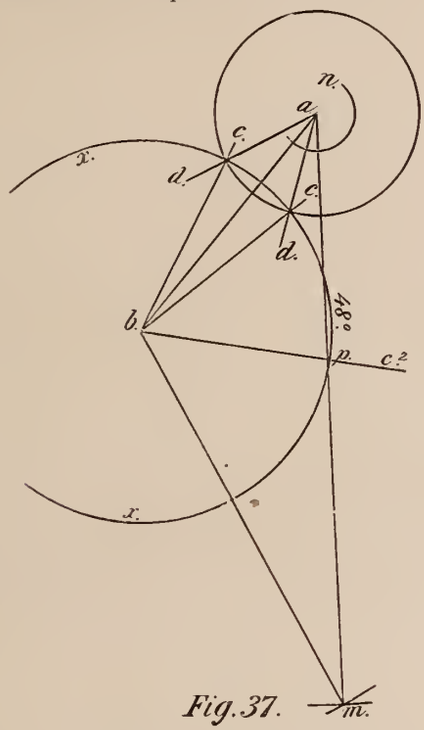


Fig. 37.

into the plate of the movement. The point *m* (Fig. 37), therefore, now represents the lower pivot hole of the arbor. The method of laying out is substantially the same as for the English style, so far as the plotting out of the wheel and roller, with their angles (537, 538).

(578) But the Swiss detent locks the third tooth from the roller, instead of the second as in the English. We therefore, when drawing the lines *bc*, with the protractor, mark another line bc^2, 48° (or the space of two teeth) from the right hand line *bc*, the crossing of which line with the wheel circle gives the point of the third tooth from the roller, and the position of the acting face of the locking pallet, as before described. Through this same crossing, from *a*, we draw the line *am*, which is the line of the detent. Having set the dividers (or other tool) to the enlarged center distance between the balance and the detent pivot holes, and with one point on *a*, we strike a curve across the line *am*. Similarly we describe another curve from *b*, with the enlarged wheel and detent center distance. The crossing of these curves, at *m*, locates the detent pivot hole.

(579) In this construction, the inclination of the locking face of the pallet may lie in the line bc^2, which gives it an angle of 10° or 12° from a right angle to the line of the detent. This is marked on the upper gauge as the second or middle notch, Fig. 36. The straight side of the notch at 2 should therefore form an angle of 100° to 102° with the edge of the gauge. If the lower gauge is used, the pallet face will of course coincide with the line bc^2 at 5, between the two notches or projections, 4 and 6, the notch 4 being for English detents, as already stated. The methods of using the gauges are described in sections (556, 557). And if the workmen depends on "sighting," (559,) the pallet face will sight directly to the center of the escape wheel pivot. It is not necessary to draw out the detent in full, as the workman will readily understand its construction from what has been said of the English detent,—remembering that it extends on below the point *m*, this end forming a counterpoise to the other. If the detent is not perfectly poised, (the hair-spring being removed,) it should be made so by altering the free end.

(580) Fig. 38 shows another Swiss construction, in which the line of the detent is drawn at a right angle to the line bc^2, at the junction of that line with the wheel circle. This is known as the tangential detent, as the line from *p* to *m* is a tangent of the wheel circle at the point *p*. The enlarged wheel-and-detent and roller-and-detent center distances are used to determine the point *m*, by the curves, as before. In this style, that portion of the detent from the pallet ring to the point is formed according to the choice of the maker, either curved to the point, or straight with a right angled or other corner near the point, as outlined by the dotted lines. The point should curve to the line *ao*, as if the line of the detent ran directly from *a* to *m*. The line bc^2 being at a right angle to the line of the detent, the pallet face should have an inclination of 8° to 10° from bc^2, to give the draw. In Fig. 36 this is shown at notch 3 of the upper gauge,—the straight side forming an angle of 98° to 100° with the edge of the gauge. In the lower gauge, the angle of the pallet face for this style of detent is given at notch 6, where the straight side forms an angle of 8° to 10° with the line *bc'* of the gauge.

(581) Many modifications of the chronometer escapement are found, but the variations from the foregoing constructions are confined to the locking and unlocking mechanism,—the impulse action as already described being given in the simplest and most advantageous manner possible. Enough has probably been said to give the workman a clear understanding of the principles which underlie all these variations of form and arrangement, and to enable him to comprehend their design and test their correctness. I will only show a plan for wheel and detent actio.. sometimes adopted with the bascule detent, the advantages claimed being the entire removal of the draw, and greatly diminishing the labor of unlocking. It consists simply of a short arm fitted on the detent arbor, instead of the usual locking pallet. The extremity of this arm may be either of steel or a jewel fitted in a slot in the end,—preferably the latter, and its exterior surface forms the arc of a circle of which the arbor center is the center. There is therefore no draw upon the tooth, and the

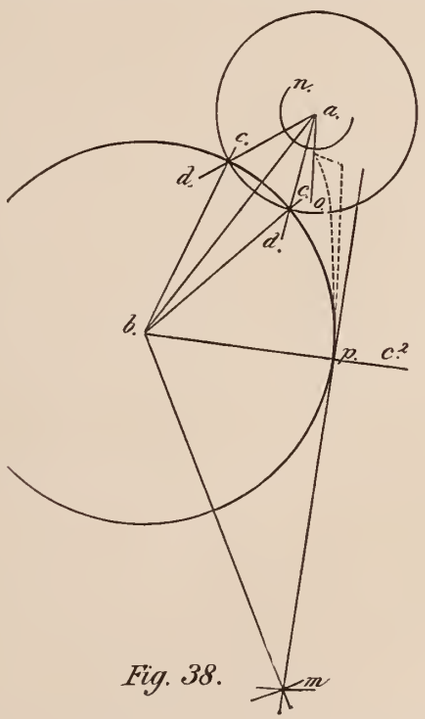


Fig. 38.

detent being poised the labor of unlocking, (aside from the resistance of the detent hair-spring,) is reduced to overcoming the simple friction of the tooth on the circular surface, and moving the weight of the detent on its axis or pivots.

(582) The lines *ab*, *am* and *bm*, Fig. 39, represent the different center distances as before,—*m* being the detent pivot hole, and *p* the end of the locking arm or pallet,—the dotted line showing its form.

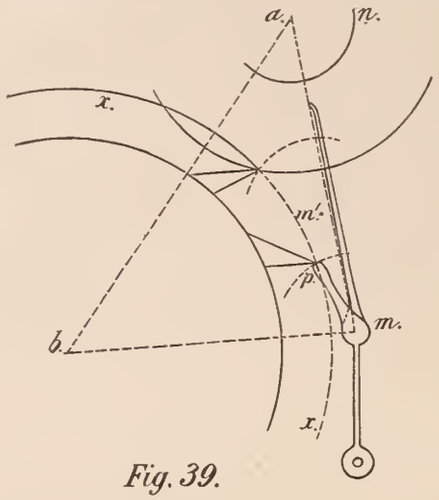


Fig. 39.

The detent is also shown, below the arm, with its counterpoise at the end. This is only one form, but it gives the idea of the construction. The objections are that, there being no draw, its hair-spring must be stiff enough to carry the detent entirely up against its screw before the escape wheel tooth reaches the pallet *p*, as it would be too weak to move the detent under the friction of the tooth, without the assistance of any draw. Again, the placing of the pallet *p*, so near the detent axis *m*, increases the unlocking angle, or distance through which the point of the detent must be moved to carry the pallet back out of the wheel circle. This will be evident on comparing Figs. 35 and 39, and noting the unlocking angle which will move the pallet *p* back the same distance in each case. This is obviated by increasing the diameter of the unlocking roller *n*. In one form, the pallet *p* locks the tooth next to the impulse roller, and its end passes either over or under it when unlocking, the escape wheel tooth being broad enough to work upon the pallet *p* and the impulse roller. In this case, indicated by the dotted curve crossing the roller edge, the point of the detent is the same distance from *m'*, the new detent center, as the pallet *p*,—the unlocking jewel being set in the end of an arm reaching from *a* nearly to the edge of the impulse roller. Further remarks on the subject of unlocking to the best advantage will be found under the head of roller and detent action. As all the benefits of a long unlocking arm, etc., can be had with the ordinary styles of wheel and detent action, together with a reasonable amount of draw, the superiority of this construction over them is not, on the whole, very evident. But the study of it will be instructive and suggestive to the workman.

(583) OVERRUNNING. We are now prepared to consider the two worst faults of this escapement: overrunning and setting. Overrunning is caused by the balance vibration being by some means increased to nearly two turns, so that the escape wheel is unlocked the second time, and a second tooth takes the impulse pallet during the same vibration. When the balance returns, it "passes" the unlocking spring twice without action, then again comes forward, and the same double action may be repeated as before. Sometimes this overrunning continues only for a few vibrations; at others for an hour or more. Consequently, such a chronometer, after being very closely rated, may some day be found on looking at it a couple of hours ahead of time, yet going as usual,—the overrunning having ceased before being noticed. If, when the wheel is unlocked, the tooth fails to lock upon the detent pallet, from a weak detent spring or any other cause, but passes the pallet and the next tooth locks, this gives a double motion of the escape wheel to an ordinary motion of the balance. This, however, is merely one variety of tripping, and arises from some wrong adjustment of the escapement.

(584) Overrunning, as already explained, is a double motion of both the escape wheel and the balance, and may occur with an escapement which is faultless in its proportions and adjustments. It is found in company with normally large balance vibrations, which were formerly considered very desirable. The more recent practice is to limit the vibrations to one and one-quarter turns, or a very little more; whereas, formerly, the effort was to reach one and one-half or one and three-quarter turns. If a watch is subject to this fault, and an examination shows the escapement to be correct, and the strength of the hair-spring well adapted to the weight of the balance, (shown by giving a close rate and correct isochronal action,) the most obvious remedy is to lessen the vibration by a weaker motive force, till the margin between the normal vibration and that at which overrunning will occur, is more than the ordinary contingencies of carrying, etc., will be able to move the balance through. This weakening of the mainspring will necessitate a readjustment of the isochronism of the hair-spring, (133,) and, if carried too far, may render it insufficient for the proper propulsion of the train. Means are therefore employed for securing immunity from overrunning which are not so radical, when that course is inadmissable, by mechanical devices.

(585) A number of remedies have been proposed, the principal of which are: 1st, movable or spring-mounted studs, with suitable projections for banking against the stud when the vibrations become too large; 2d, a vertical pin planted in the balance arm, on the side where the hair-spring opens the most, and at such distance from the center that, if the balance vibration exceeds a certain safe limit, the hair-spring will abut against this pin and the further opening of its lower coils will thus be measurably checked; 3d, a light steel ring, of about the same radius as the distance of the above mentioned pin from the center, having a sort of collet or hub so that it can be fixed upon the balance staff, below the hair-spring,—the whole being somewhat similar in shape to a deep compensation balance when turned out, but the rim not yet cut or screwed. The second method seems to be most in favor, in practice. The third would appear to be more thorough and certain, and is well spoken of, but I have no personal knowledge of its value. It acts upon the same principle as the gold pin, but goes further; and when the hair-spring has opened to the prescribed limit, with a vibration of say 320°, or a trifle over seven-eighths of a turn, the lower coils enclosed by the ring would be wholly and effectually prevented from opening any further. This virtual shortening of the spring, and the greater stiffness of the remaining coils, would quickly check any increased vibration of the balance, and prevent overrunning.

(586) In carrying out the second method, it will perhaps be found that there is no arm of the balance situated where the arm of the pin could act upon the proper portion of the coils. In such case the pin should be fixed in the nearest arm, and the hair-spring collet turned enough to bring the proper portion of the coils around to the pin. This will of course necessitate the turning of both the impulse and the unlocking rollers on the balance staff, to bring them into their former relative positions to the hair-spring bar or collet. Before disturbing the collet, therefore, "sight" very carefully from the rim to the center of the balance staff, and mark on the rim the positions of the center of the collet, and of the acting faces of the impulse and the unlocking pallets. After moving the collet as mentioned, mark its new position on the rim as before, then by careful measurement transfer the other two marks to the same distance from this as they were from the former collet mark. Finally, turn the rollers till the acting faces of the pallets come exactly in the line from these new marks to the center of the staff. If this has been accurately done, the parts will occupy the same relative positions as before the alteration of the spring.

(587) Of course the ring method would require no such alteration, as the ring encloses the whole circle of the spring. But it may be asked, what must be the effect upon the isochronism of the spring, of suddenly and totally checking the opening of three or four coils at the lower end? It would apparently be more objectionable than

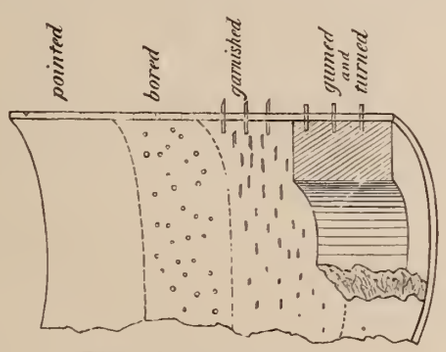
that of the simple pin, and the question is whether the very thoroughness of the ring plan would not be its worst fault. Here is a need for thorough testing and close observation, and it is to be hoped that those who have reliable data on this point will publish them for the benefit of the trade. The injurious effect of either plan would probably be but slight, as it would only occasionally come in play *i. e.*, when overrunning would otherwise occur. But, even if considerable, it would be preferable to that of frequent overrunning.

Repairing Musical Boxes.

By L. A. Grosclaude.—No. 1.

KNOWING by experience how very few persons are acquainted with the process of manufacturing musical boxes, moreover, the boxes which are returned to the manufacturers for repair bearing sufficient evidence of the ignorance of many of those persons to whose hand they had been committed previously, for repairs, it might be interesting as well as profitable to buyers and repairers, to give some few indications, in the Jewelers' Circular, as to the mode of manufacturing them, and particularly the manner in which they may be repaired.

It frequently happens that a small defect may put a box out of service, the remedying of which may occasion a great loss of time to one not acquainted with the first notions of the construction of a musical box, but which can be repaired in a few moments by one knowing the theory and mechanism of the same. It is to attain this object that I will here give some idea of our manufacturing processes and some practical hints for repairing, hoping they may be explicit, if not, further explanations or amplifications will be cheerfully accorded. My intention is not to give a full description of *all* the manufacturing processes used in musical boxes. It would take too much space and many of them would be of little interest or utility to workmen abroad. I will more particularly enter into details regarding those parts which have a close connection with the different accidents which may happen to musical boxes.



Part of a cylinder broken showing 5 different operations.

Fig. 1.

The manufacture of a musical box may be divided into two very distinct parts. The first includes all that concerns the mechanical part of a box, that is, wheels, pinions, barrel, spring, fly-wheel, etc., or, if I may use the term, the clock-work of the box. The second concerns more particularly the musical part of the box, viz.: putting the desired tunes on the cylinder, tuning the key-board, finishing these two parts, and putting them in their proper places, so as to have a playing box. About the first part I will say nothing, everything concerning it having too great a resemblance to watches, and especially to clocks, for necessitating any further description here. Clocks and watches being universally found, and everywhere easily repaired, the case will be the same with the mechanism of a musical box. I will therefore proceed directly to the second part. For finishing an ordinary musical box the following processes are necessary:

First, The tunes are pointed (*piqué*) on the cylinder. (Previous to this, of course, the choice of tunes is made, with the notes necessary for playing them.) This pointing is effected by an instrument in which the cylinder is placed on its two points. A needle, placed on a dial, serves to make the cylinder turn, in accordance with the measures of the music (tune), whilst the pointers (*pointeaux*) glide from one end of the cylinder to the other, making small dots on the cylinder in accordance with the notes of the tune.

Second, At each one of these dots, a hole must be bored, of the same size as the teel pegs. This is made by a very simple boring machine especially adapted for the purpose.

Third, In each of these holes, a steel tempered peg must be placed, and all forced into the same height above the cylinder. The pegs are long enough to have a part in the inside of the cylinder.

Fourth, The cylinder is partly filled with gum (*mastic*) in order to fasten the steel pegs, and to give to the whole cylinder a certain consistency.

Fifth, The cylinder is put on a lathe, and, with a file, is turned so as to give to all the pegs a flat summit, and to make them all of a perfectly cylindrical surface.

Sixth, The key-board must be tuned in accordance with the note put on the cylinder.

Seventh, This key-board must be attached by screws to the plate of the musical box.

Eighth, The ends of all the keys (*lames du clavier*) must be put in their right place, in respect to height (they must all be on a level), and with regard to the pegs of the cylinder.

Ninth, The key-board in place, each peg of the cylinder must be bent forward, so as to pass directly by the middle of the point of the key corresponding, and more or less bent, so as to allow the key to produce its sound at the right instant; a special instrument with dial and hands is here again necessary.

Tenth, Steel spirals must be put at the end of each key and bent in the right shape so as to stop the vibration of the key, each time a peg comes to lift it.

In the preceding description I have intentionally omitted several operations which are of no great consequence for a general comprehension. Before giving further details I will make three preliminary remarks. The first is a precautionary suggestion which has already been given in the Jewelers' Circular, No. 5, *i.e.*, "great care should be taken never to take out any part of a box, except the key-board, without ascertaining whether the spring of the barrel is quite run down." It is easily understood that by lifting the keys of the key-board, if, for instance, the fly-wheel is removed, the spring being partly wound up, the cylinder, not being able to turn without the pegs attached to it, will revolve rapidly, and one of two things must happen, either the steel pegs of the cylinder will give way under the resistance of the key-board, and then break or be bent backwards, or if the pegs be strong enough to resist, the key-board will be destroyed in pieces. Very often both cylinder and key-board may be broken in this way. Therefore, after having taken out the key-board, ascertain if the spring is at rest, and, if not, let the box run down, and for more security, that no strain exists on the spring, lift the ratchet which hinders the spring from running backwards, and unwind it.

My second suggestion is: Before commencing to repair a box, observe at first if the pegs of the cylinder are all bent in the same direction, and if there be a few missing. If this be the case, there is all probability that the box need not be sent to the manufactory for repairs. But, if a certain number of pegs be wanting, or bent in all directions, especially backwards, no hope must be entertained of repairing the box, except at the manufactory itself, where all the particular tools are found, necessary for making a musical box entire. In this way much expense may be avoided and time and annoyance saved.

Thirdly, a very wrong impression is widely spread concerning the repairing of a musical box, which I will endeavor to correct. Very often a badly damaged key-board is alone sent to the manufacturer to be repaired, or changed for a new one, or a new key-board is de-

manded to replace an old one, without sending back the whole box. In the actual state of manufacturing musical boxes it is impossible to make a new key-board for a given cylinder, or the reverse—a new cylinder for a certain key-board—without having in hand the entire musical box. These two parts, which are the two most important of a box, are too closely connected to permit the mending of one without the other, or without the plate (*platine*) which carries them both. It is only when one or two keys are broken that it is impossible to replace them without the entire box. In a second article will be given some practical ideas as to repairing the key-board particularly, and, in a third and last article, will be seen the position this key-board must occupy respecting the cylinder, and in general how to have a good *playing* box.

The Manufacture of Jewelry.

BY GEORGE WALLIS.

THE first step is to understand the nature of the material used. Of course modern trinkets, which may come to a certain extent under the generic name of jewelry, are manufactured of a great variety of materials besides gold, silver, and base metal covered with gold or silver. Of such are jet, glass in imitation of jet, tortoise-shell, bog-oak, coral, wood of varied tints, bone, ivory, and other substances. We must, however, confine our attention primarily to gold and silver ornaments, set with stones and otherwise embellished, and their imitations; treating of objects made in any other material incidentally, or as a means of illustration.

Gold in its pure state is never used in the manufacture of jewelry or plate. It is always alloyed with another metal or metals, and the quality is considered to be at once sufficiently pure, and yet well adapted to industrial purposes, when 18 parts of pure gold are combined with 6 parts of copper, copper and silver, or copper, zinc, and silver. Gold of this quality is known as 18 karat gold. French jewelry is traditionally of this standard. The English standards, as indicated by the numerals stamped on objects at the Assay Offices, are, 22 karats, 18 karats, 15 karats, 12 karats and 9 karats. The latter is used in the lowest kind of manufactured jewelry, but it is only by tradition that such a quality of metal can be called gold in any true sense. Still, custom does not recognize it as a base metal, in the usual acceptance of that phrase.

The assay mark of much of the foreign jewelry is a very uncertain guide as to quality, because the manufacturer is permitted to secure the attendance of officials of the Assay Offices at the manufactory, which may easily be made to cover abuses of the Assay mark.

As a contrast to the character of the 9 karat gold, the standard of the English sovereign, and in fact of most gold coins, may be quoted. This is 22 karat, or only two parts of alloy in twenty-four, which is really necessary to harden native gold, and make it stand the wear and tear of use as coin.

Formerly copper only was used as an alloy, and this will account for the red tint which is often seen in pure examples of old jewelry. The Dutch at one time had a special predilection for jewelry made of gold of this character. The modern use of zinc, in addition to silver, with the copper as an alloy, gives the manufacturer a great control over the tint of the metal and enables him to adapt it to the special purposes to which it has been applied. By the use of these and other alloys, grey, yellow, red and green tints are obtainable, which colors are sometimes introduced with great taste, in relievo groups of foliage, flowers, etc.

Gold is usually purchased by the manufacturer from the refiner, and then alloyed according to his own wants and standard. Old coin is used to a considerable extent, and the Bank of England supplies it at the rate of £3, 17*s.* 10½*d.* per ounce. As the character of the alloy of gold is well known, whether English or foreign, its purchase is a matter of considerable convenience to the manufacturer. The gold of old jewelry, injured by wear or out of fashion, is also rendered available to a large extent, and it is feared that many exquisitely wrought historical examples of the art workmanship of past periods have found their way to the refiner's crucible through the ignorance of the possessors, or the cupidity of dealers in old gold and silver objects. Happily the demand for objects in museums has been the means of saving many an admirable example of old jewelry from the melting pot, through the fact becoming known that the bullion value was its lowest value, and that the workmanship increased that value in proportion to its excellence and the artistic character of the design. The fact too that some of the most exquisite examples of the jewelry of the sixteenth and seventeenth centuries were so designed and wrought, that the minimum of gold consistent with strength of construction was used, prevented their being utilized as old gold, as comparatively little metal would have resulted from breaking them up. Thus the weight of metal, or at least extent of surface of metal, which will ensure destruction of a good deal of modern jewelry when out of fashion, has, by a reverse process, saved many an exquisite jewel of past ages.

After the metal, which in any circumstances must constitute the structure in any article of jewelry, come the stones, real or imitation, with which this structure is decorated, or which may, as we shall see in due course, constitute the primary *motif* of the design. To enumerate the stones used would be simply to give a useless list, unless the leading characteristics of each could be detailed, which would be out of place here. It will be sufficient for our purpose to illustrate certain peculiarilies of stone by the diamond, which, from its rarity and beauty, stands at the head of all gems when cut. Chemically it is a form of pure carbon. As a substance it is the hardest known, and can only be destroyed by intense heat. It is a a popular mistake to suppose that diamonds are all colorless. A green diamond of perfect lustre is of great value alike for its beauty and rarity. In fact diamonds are found of various colors,—blue, red, yellow, and the tints resulting from combination, and even black and opalescent.

Superficially viewed, the diamond may appear in its uncut state very much like any other crystalline substance, just as specimens of fine quartz have been mistaken for diamonds; and I may now quote some useful hints from Professor Tennant's "Lecture on Gems," as to the peculiarities of the crystalline formation of precious stones. He says: "By attending to the forms of crystals, we are quite sure that we shall not find the emerald, sapphire, zircon, or topaz, in the form of a cube, octahedron, tetahedron, or rhombic dedecahedron; nor the *diamond*, spinel, or garnet, in that of a six-sided prism, and so with other gems. For want of a knowledge of the crystalline form of the diamond, a gentlemen in California offered £200 for a small specimen of quartz. He knew nothing of the substance except that it was a bright shining substance, excessively hard, not to be scratched with a file, and which would scratch glass. Presuming that these qualities belonged only to the diamond, he considered that he was offering a fair price for the gem; but the owner declined the offer. Had he known that the diamond was never found as a six-sided prism, terminated at each end by a six-sided pyramid, he would have been able to detect the fact that what he offered £200 for, was really not worth more than half-a-crown."

Diamonds are valued by weight in *carats*, the carat being a little under five grains troy. The term is derived from the name of an African bean.

The cutting of gems is a very delicate and important operation, that of the diamond being the most difficult, from its extreme hardness and formation. It can be split by a steel tool, if the action of the tool be aimed and the blow be given in the direction of the structure. The cutting is so uncertain in its results, that diamond cutters consider the retention of one-half of the original rough diamond as a most fortunate result of the operation.

Precious Stones and Gems.

BY EDWIN W. STREETER.

THE wide-spread accumulations of drift conceal the surface of the country over which they are spread, rising up the sides and covering the summits of the little hills which form so marked a feature in the scenery of the diamond districts. These hillocks, which in some cases attain to a height of upwards of 100 feet, are known locally as *kopjes*, and many of them have become famous for their yield of diamonds. Such, for example, is the Colesberg Kopje, now called the Kimberley Mine, on the north side of the Vaal, where "dry diggings" have been prosecuted with remarkable energy and success. But the most celebrated group of dry diggings is that around Du Toit's Pan, De Beer's, and Bultfontein, situated about twenty miles south-east of the missionary station of Pniel.

The origin of these diggings is curious. A Dutch boer, named Tan Wyk, who occupied a farmhouse in this locality, was surprised to find diamonds actually embedded in the walls of his house, which had been built of mud from a neighboring pond. This led to examination of the surrounding soil, which was soon found to contain diamonds. On continuing to dig lower and lower, diamonds were still brought to light; nor did they cease when the bed-rock was at length reached. Such was the origin of the now famous Du Toit's Pan. The "Pans" are local depressions in the flats—basin-like hollows, frequently of large size, reaching in some cases to a length of two or three miles. They receive the drainage of the surrounding district, but having no outlet, the water as it evaporates acquires a brackish taste, and in dry seasons the pans exhibit a whitish saline incrustation—"natron."

All the dry diggings appear to possess certain common features. Each site is a more or less circular area, generally surrounded by horizontal shales, the edges of which are slightly turned upwards round the margin of the circle. This evidently suggests that the shales, which were originally horizontal, have been pushed aside by the intrusion of matter forced from below. Indeed, many geologists whose opinions are entitled to much weight, maintain that the diamond-bearing rock is of eruptive origin, and has been brought up in the form of columnar pipes thrust through the surrounding shales. Thus, Mr. Dunn regards the pipes as "merely the channels that connected ancient volcanic craters with deep-seated reservoirs of molten rock." On the other hand, there have not been wanting observers who take an entirely opposite view of the deep deposits in the dry diggings.

The upper portion of a pipe generally consists of a reddish, sandy soil, accumulated no doubt by the action of wind. Below this comes a layer of calcareous tufa, or a light deposit of carbonate of lime; and it is by no means uncommon to find diamonds adherent to this tufaceous rock. At a still lower depth, we reach the main contents of the pipe. This consists of a strangely modified rock, in places much broken up, and passing into a breccia. Its exact nature has puzzled petrologists; but the rock has been most carefully examined by Prof. Maskelyne, F.R.S., and the component minerals analyzed by Dr. Flight. The base of the rock is a soft mineral, soapy to the touch, and of green or bluish color; it contains angular fragments of shale, more or less altered, associated with various distinct minerals, including crystals of a bright green bronzite, of a hornblendic mineral resembling smaragdite, of a new species of vermiculite, called *vaalite*, with garnet, ilmenite, etc. Veins of calcite, and nodules of iron-pyrites, are occasionally present. But the only minerals that attract the miners are the diamonds. These are sprinkled pretty freely through the "stuff," sometimes as beautifully formed crystals, but frequently as mere fragments and splinters. They are said to be most abundant in the neighborhood of dioritic dykes, but their distribution is very irregular; in one claim they may be richly disseminated, while in a neighboring claim they are but sparsely scattered through the rock. The diamond-bearing stuff has been worked in some cases to depths exceeding 200 feet. Each pipe is said to yield diamonds easily distinguished from those of other pipes, so that buyers on the fields can generally tell on looking at a stone, from which locality it has been obtained. These local peculiarities suggest that the stones have been formed in, or near the centres where they are now found. Indeed, it has been maintained that the rock, now filling the pipes, was, in its unaltered state, the original home of the diamond—that the gems are, in fact, in their proper matrix. In support of this view, it should be mentioned that most of the crystals are sharp at the edges, and exhibit no signs of abrasion, such as we might expect to find had they been transported far from their original site. On the other hand, a large proportion of the crystals have evidently been shattered, and exist now as mere fragments, showing that the rock has suffered great disturbance, though it may only have been during its projection to the surface from some deep-seated source. It is a curiously significant fact, well worth noticing, that many of the crystals of diamonds in these pipes exhibit, on their octahedral faces, regular triangular depressions, strongly suggestive of the triangular striations which the late Gustav Rose produced on diamonds, by heating them in a muffle, so as to undergo incipient combustion.

According to the views just explained, the South African diamonds were originally developed in an igneous matrix, belonging, probably, to that large series of eruptive rocks which have burst forth through the Karoo strata at so many points in South Africa. In the dry diggings these diamonds are probably not far removed from their original position; but by denudation of the diamantiferous rocks, the gems have been carried far and wide over the country. In the river diggings they have been transported to their present position by the action of running water, while in some of the superficial deposits elsewhere they may have been distributed by means of moving ice. Such, at least, are the several hypotheses which have been advanced to explain the origin and present distribution of the diamonds. Our aim has been to explain all these hypotheses fairly, without committing ourselves to any, and without preferring one to another.

Dismissing so vexed a question as that of the genesis of the diamond, we tread upon firmer ground when we pass to a description of the gems which have been discovered in the South African fields. Scarcely a decade has passed since these fields were first known, and during that brief space of years a large number of stones of unusual size have been brought to light. The high proportion of large sized diamonds is indeed a notable feature in the South African discoveries. The "Star of South Africa" weighed in the rough, 83½ carats; and, after cutting, 46½ carats. A diamond of pale yellow tint, weighing 112 carats, was brought to Prof. Tennant by an old student, and yielded a brilliant of 66 carats. Again, a stone of 124 carats was found at Du Toit's Pan, by Messrs. Stevens and Raath, on July 21, '71. But the largest African diamond yet discovered is the famous "Stewart," which was consigned to Messrs. Pittar, Leverson & Co. It weighed in rough state, 288⅜ carats (nearly two ounces troy), was by far the largest ever found in South Africa, and according to the best authorities, was only exceeded in size by three others in the world. It is of a light yellow color, beautifully crystallized.

The following history and particulars of its discovery are extracted from the *Port Elizabeth Telegraph*, of November 22d, 1872: "The claim from which this gem was taken was originally owned by a Mr. F. Pepper, by him sold to a Mr. Spalding for £30, and handed over by the latter to one Antonie to work on shares. The claim was quite an outside one, and not thought much of by the owner, but as others were finding near him, he thought it was just possible he might find something. He persevered until, first, the so-called 'Fly Diamond' (also in Messrs. Pittar, Leverson & Co.'s possession for sale), and, a few days afterwards, this gem rewarded his labor. Antonie's feelings when he first obtained a glimpse of the treasure may be better imagined than described. He says that he was working in the claim, when he told his boy to leave off picking in the centre and commence at the side. Not being understood, he took a pick and began himself, when he was suddenly spell-bound with the sight of a large stone

looking like a diamond. For some minutes he could not speak or move for fear of dispelling the apparent illusion ; but, collecting his energies, he made a dart forward and clutched the prize. Even then, however, he did not feel quite safe, and it required a grand effort to reach Mr. Spalding, a cart having to be called into requisition. For two days afterwards he was unable to eat anything, so excited were his feelings."

The "Dudley" diamond is another important Cape stone, weighing about 46 carats, triangular in shape, of great brilliancy, perfectly colorless, and cannot be distinguished from an old Indian stone. It was sold by Messrs. Hunt & Roskell to the present Earl of Dudley, and was mounted by them, with other diamonds, as a "head-ornament."

While South Africa has thus been remarkable for yielding stones of large size, it should also be borne in mind that the new supplies are equally satisfactory as to quality. True, a large number of the diamonds are "off-colored" stones, generally exhibiting a delicate straw-tint, but, nevertheless, extremely beautiful when properly cut. At the same time, a very fair proportion of the South African stones are diamonds of the first water, rivalling in beauty and purity the finest Brazilian and Indian stones. It has been estimated that about 20 per cent. of the Cape diamonds are of the first quality, 15 per cent. of the second, and 20 per cent. of the third quality, while the remainder is "bort." All diamonds which are too impure for cutting are now known under the general name of *bort ;* and these possess a certain market value, as they may be turned into rose diamonds, and the powder which they yield, when crushed is used for cutting diamonds, and for engraving hard gems.

An interesting specimen in my possession exhibits several octahedral crystals of diamond grouped around a central nucleus of dark-colored bort. This specimen weighs 19 carats, and was obtained from the diamond fields by my own explorers.

During the time the expedition was working at the Cape I was so convinced of the superiority of the river stones over those of the dry diggings, that I contemplated giving orders for machinery to be made with the object of turning the course of the Vaal River. Thus I hoped for some months my diamond party might have worked in the river bed. This project was abandoned in consequence of the ill-health of the leader of the expedition. I was none the less convinced, from my knowledge of Indian diamonds, that the finest stones were to be found in the river bed. Time has proved the correctness of my anticipations ; for diamonds rivalling Indian stones have been found in the river bed of the Vaal. A "drop," mounted by me, with a twin of clear cinnamon color (also from the Cape), was declared by several diamond merchants, of the greatest experience, to be an Indian and not a Cape stone !

Although immense numbers of diamonds have been brought to light during the recent workings in South Africa, it is notable that not a single piece of *Carbonado*, now known only as carbon—the black, impure variety of diamond common in Brazil—has yet been discovered. In fact, while certain points of resemblance have been traced between the occurrence of diamonds in Africa and that in Brazil, there are other points in which such a comparison entirely breaks down. It may be said, indeed, that in many respects the diamond fields of Africa are unique.

AUSTRALIAN DIAMONDS.

Although three, at least, of the Australian colonies have yielded diamonds, it is only in New South Wales that they have been found in sufficient quantity to invite systematic exploration. As far back as the year 1851, Mr. E. H. Hargraves and the Rev. W. B. Clarke, in a report dated from Guyong, referred to some specimens of gold, and to a number of gems, including what they call, rather vaguely, "a small one of the diamond kind," found in Reedy Creek, near Bathurst. But it was especially the Rev. W. B. Clarke, a gentleman well known for his researches in Australian geology, who first attracted public attention to the diamonds of New South Wales. Four specimens had been brought to him from the Macquarie River, near Sutton's Bar, in September, 1859, and a fifth the following month, from Burrendong. In the meantime he had received diamonds from Pyramul and Calabash Creeks. These discoveries were considered by Mr. Clarke so significant, that he wrote a description of the occurrence, boldly heading it with the startling, title "New South Wales a Diamond Country." This announcement was not commercially justified till seven or eight years later, when occurred the gold rush at the Two-Mile Flat, on the Cudgegong River, about nineteen miles north-west of Mudgee. As soon as the gold diggers had set to work, they detected diamonds ; and in July, 1869, operations were conducted by the Australian Diamond Mines Company, of Melbourne. The Cudgegong empties itself into the Macquarie, which is an affluent of the Darling.

At the Mudgee workings, gems were found in an old river-drift, distributed in local patches, which appear to be remnants of deposits once widely spread over the whole district, but now partially removed by denudation. These ancient river gravels occur at various distances from the actual channel, and at elevations of forty feet or more above the level of the river. They are generally covered by a protective layer of basalt, sometimes columnar ; and shafts have been sunk through the basaltic cap, so as to reach the underlying diamond-drift, which rests either on vertical strata or on massive greenstone. The gravels contain pebbles and boulders of quartz, tin, crystals, jasper, agate, and other siliceous minerals, mixed with coarse sand and clay. Many of the boulders are remarkable for their peculiar polish. In some places the materials of the drift are united by a siliceous coment, into a compact mass, colored pale green by silicate of iron. Among the pebbles of the gravel the dilligent seeker may find many of the rarer minerals, including crystals of topaz, sapphire, ruby, zircon, spinel, garnet, a peculiar vesicular variety of pleonaste, etc. ; and even this catalogue might be extended to include all the varieties of minerals already discovered, but, for my present purpose, I need only add that it includes two of the most prized substances in nature—gold and the diamond. The diamonds are sparsely and irregularly distributed through the gravels ; but, nevertheless, when large quantities of the drift are sifted and washed, the gems are brought to light, but hardly in sufficient numbers to pay for working. For example; during the first five months' washings no fewer than 2,500 diamonds were picked out ; but, unfortunately, most of the stones were extremely small, the largest of the Mudgee diamonds being a colorless octahedron weighing 5⅝ carats.

We find them in a deposit of gravel, but they have probably been washed out of the older drift. Occasionally, too, they have been found in "water holes" in the present river bed ; but their origin may then generally be traced to the "tailings" washed into the river at such points from the gold diggings, and therefore we expect to track the diamonds back to the old drift. When found in the river bed, the stones are frequentiy scratched and fractured.

Within the last two or three years a diamond field has been opened up near Bingera, in New South Wales. This town is about 400 miles north of Sydney, on the River Horton, popularly known as the Big River. How the diamonds occur at this locality has been well described by Professor Liversidge, of Sydney. The diamond bearing deposits are situated in a kind of basin, about four miles long and three miles wide, hemmed in by hills on all sides save on the north. An old river drift, probably an ancient bed of the Horton, rests on rocks of the Devonian or of the Carboniferous age, and is associated with basalt, by which it appears, indeed, to be overlain. On some places the materials of the drift are compacted together into a conglomerate ; so that the mode of occurrence of the diamond at Bingera strikingly resembles that at Mudgee. The minerals composing the gravels are also generally similar in the two cases, though points of difference are not wanting. One of the best indications of the presence of the diamond, according to the Bingera miners, is a black tourmaline, known locally as "jet stone." Some of the diamonds are clear and colorless, others have a pale straw tint, and all are of small size, the largest weighing only eight grains. According to an examination of some of the Bingera drift, by the Gwydir Diamond Mining Company, a ton of "stuff" yields on an average twenty diamonds. Up to August 26th, 1873, the Eaglehawk claim had produced 1,680 diamonds ; but, as the aggregate weighed only 803 grains troy, the very small size of the average stones is sufficiently apparent. It has been roughly estimated that at least 10,000 diamonds have hitherto been found in New South Wales ; although it must be remembered that the workings have not been vigorously prosecuted.

Various Processes of Coloring and Finishing.

BY G. E. GEE.

BIRMINGHAM PROCESS OF WET-COLORING.

SOME time after the introduction of the art into England, attention began to be directed to the application of the process to qualities inferior to those already named; and it was found that by the addition of small quantities of spirits of salts to the ingredients already in use it was possible to adapt it; and, in attempting this experiment, Birmingham was not backward, for it it was one of the first towns which successfully accomplished it. Of the following ingredients take—

Nitrate of potassa . .	14 ozs.
Common Salt . . .	7 "
Alum	7 "
Spirits of Salts . . .	2 "
	30 ozs.

Pound them all fine and mix well together; then take a blacklead color-pot, about eight inches high and seven inches across the mouth, and put the mixture (acid excepted) into it, which must dissolve very gradually. It should on no account be hurried or forced, for if it burns the color will be spoiled, and consequently unfit for the work. As the heat increases the whole will begin to dissolve; then stir well with a wooden spoon, and, when the color boils up, add the spirits of salts (muriatic acid), when the mixture will sink; stir it again, when it will soon boil up. Immediately take the work which has been properly prepared for the purpose, and fastened in bunches with fine silver or platinum wire, and immerse it in the color for four minutes, keeping it well on the move all the time, so that all parts may be acted upon alike; this must be done in such a manner as to prevent scratches and marks, by its touching the bottom or sides of the pot. At the end of the above time, take out the work and rinse it well in quite clean boiling water, of which a copious supply should be provided. Next place it in the color for a minute and a half, remove it again, and rinse well in fresh hot water. Now add two ounces of hot water to the preparation in the pot, when it will sink but soon rise again. When this takes place put in the work for one minute; it must then be withdrawn, and rinsed in fresh hot water. It will by this time begin to show the right color, if all things have gone on properly. Lastly, dip the work in the mixture again for half a minute longer, finally rinsing for the last time in two vessels of fresh hot water, and then it should possess a very beautiful color.

This coloring mixture should be used in proporrion to the amount of surface the articles present to its action. The proportions given will be amply sufficient to color effectually ten ounces of gold chains with plain surfaces, or five ounces of jeweler's work; and, if skilfully managed during the operation, it will never prove a failure. This method will color gold alloys very richly and evenly, if not below 14 karats; it may therefore be used advantageously to such as are not inferior to this quality. The average loss in taking all kinds of work will be about one pennyweight for every ounce submitted to its action.

Nevertheles, in wet-coloring, it sometimes happens, even under the most skilful management, that the color burns, which gives the work a dead-brown appearance; if, also, the color-pot has not been properly cleansed after a previous operation, this effect will also be produced; so that in this process everything should be kept quite clean and free from grease or iron of any kind, as these are most injurious to the production of the fine rich results which are sought for.

PREPARING THE WORK.

There are several methods, as we have already remarked, of preparing the work for wet-coloring; each operator adopting the one which suits him best, and appears to claim an advantage over the others. We do not intend to assert that there is any particular advantage likely to accrue from the adoption of any particular process in the preparation of the work. The main principles are, thorough polishing (though this need not be so much the case as for dry-coloring, but still it is of great importance) and cleanliness, the latter element being very essential in the production of a good color. The operator cannot be too careful in enforcing these two conditions.

Some persons prefer to color from the black anneal; others to boil for a time in nitric acid pickle; others again, after the work has been well annealed, boil out in sulphuric acid pickle, and afterwards in clean water. In adopting any of these plans, the method is that, after the work has been well polished by means of the finest materials, and washed out, it must be placed on an iron or copper pan and heated to redness upon a clear fire, the latter proceeding being of importance. If it appears greasy in the interstices, and it is desired to color it black, it should be boiled out and again annealed; it may then placed aside to cool, and afterwards suspended upon the wires usually employed for this purpose. In the work of recoloring articles, it is by far the best plan to anneal them. Where this can be done, boil them out and again anneal them, which process is easily performed. It is an economical plan to recolor this description of goods in old color, which should always be preserved for the purpose. If this appears dry or nearly so, when put into the pot, add an ounce of acid and one ounce water; if tolerably liquid, make no addition whatever, for, in some instances, and especially where the alloys contain a great proportion of copper, the weaker the preparation the better and brighter is the color produced upon the work.

FINISHING THE WORK.

After the process of wet-coloring it is absolutely necessary that the work should go through another operation, that of "scratching," which consists of submitting it to the revolving action of a circular brush of fine brass wire, mounted upon a lathe, after the manner of the round hair brushes used in polishing, and upon which a solution of weak ale is allowed to run from a small barrel with a tap to it. This removes any dull color that may be upon the work, and gives it a perfectly bright and uniform surface. Frosting is effected by keeping the points of the wires of the brush quite straight, and running the lathe very fast, just letting the ends touch the surface of the work; to do this accurately requires great practice. After this process has been performed, the work must be well rinsed in either hot or cold water, and finally dried in warm boxwood sawdust, which must not be allowed to burn or char in any way; if so, the color of the work will be much damaged, and part of the beauty destroyed. A soft brush will remove all traces of sawdust from the interstices of the articles which have passed through this operatton.

GERMAN PROCESS OF WET-COLORING.

The German process of coloring gold articles can be applied to that metal of a still inferior standard: and, if carefully operated upon, even 12 karat gold may be made to assume a beautiful rich yellow, possessing all the appearance of fine gold, by immersion in the following chemical preparation until the desired color has been obtained. It consists in some cases of a reduction of the salts usually employed, the abolition of the alum altogether, whilst a double proportion of the spirits of salts (muriatic acid) is added to supply the place. A very good mixture, to which we have just referred, is prepared as follows, one which is especially recommended for large work. Take—

Nitrate of potassa . .	14 ozs.
Common Salt . . .	7 "
Muriatic Acid . . .	5 "
	26 ozs.

Reduce the above salts to a fine powder in a mortar, keeping them perfectly clean all the time; well mix them together; then take a blacklead color pot about seven inches high and six inches across the top, place it on the fire and well dry; when this is done put into it the coloring salts, stirring them well with a wooden spoon; when thoroughly dried fine and hot, add the muriatic acid (spirits of salts); the color will then soon boil up. Now take the work which has been

previously prepared quite clean and free from grease, and also suspended upon fine silver or platinum wire, and place it in the preparation for three minutes, keeping it slightly on the move during this period, when it must be withdrawn and instantly plunged into a vessel of clean boiling water, and then into a second vessel of the same. Next add two ounces of hot water to the color, and, when it boils up, again place the work in the mixture for one minute longer; rinse in fresh boiling water as before stated. It will then be done, and of a fine color if all things have been carefully attended to; dry in clean boxwood sawdust as usual. The work must be well and carefully scratched in weak ale, which liquid is perhaps the best for all practical purposes, or burnished with a proper burnishing-chain if desired; we much prefer the latter, because of the very rich color it produces. After the work has been well rinsed in clean water, and dried as before pointed out, it is then ready for the transactions of the commercial world.

The drying of the salts at the commencement is to remove the water taken up during their crystallization, which operates injuriously when so large a proportion of muriatic acid is employed. A coloring is given to jewelers' work by this process in a much quicker time than could possibly be done by any of the preceding ones, but it is nevertheless much more difficult to perform. It takes considerable practice to become a good colorer; for, if not very skillfully treated, the large proportion of muriatic acid has a tendency to roughen the work, as well as to reduce it to a honeycombed state, which latter condition would render it quite unsalable. The time occupied by this process is four minutes, and the loss occasioned thereby will average about eighteen grains per ounce of the work under manipulation.

The Birmingham process occupies about seven minutes, with a greater proportion of loss of material. Gold alloys, to be effectually colored by the German process, should contain rather more silver than has been recommended for the others of which we have treated, because by this process a clean, deep and smooth color cannot be produced under any other circumstances. The work would be otherwise frosted or sweated, and a very inferior color would be the result if these or similar instructions were not carried out.

It is well to avoid as much as possible the introduction of wet articles into the color without previously shaking the surplus water from them. Neither should the color be thinned until the articles submitted to its action begin to show in an unmistakable manner the appearance of gold; for, if this be done, they are sure to come from the color pot in a very rough state. This appearance of the work in the German process has successively baffled the skill and ingenuity of several workers of the old school in England; and we have often smiled at the arguments in favor of the addition of water when the color of the work could not be properly effected in the given time but came out black, which was probably due to the weakness of the acid employed, as it is liable to lose its strength if the mouth of the bottle be not sufficiently secured. The addition of water at such a time of this would certainly be fatal to the excellence of the finish. The proper remedy would be an increase of muriatic acid to the coloring mixture, an extra dip into which would soon produce the desired color. This should always be done before the weakening or *watering* process begins.

Articles of the commoner qualities, to be effectually treated by this process, must not under any considerations whatever (as we have previously remarked) contain too much copper, for this is the cause of many failures. Under other circumstances, where a large proportion of copper is employed, this weakening process seems to facilitate the object to be achieved; and where a much smaller proportion of muriatic acid is mixed with the other ingredients its addition is both practicable and advantageous. By the addition of water to the German mixture before the color has been brought up, upon a second immersion of the work a violent attack is made upon it, which, instead of producing color, acts as a solvent on the metals; and so powerful is this, that a few minutes immersion would result, if the articles were thin, in their utter destruction. In concluding our observations on gold coloring we have simply to remark that the whole process is nothing less than an abstraction of the baser alloy from the surface, which leaves the gold behind with a full, rich color, its effects being to add richness to the color given to the surface of gold articles of inferior standards, and being nearly perfect in its resemblance to fine gold itself.

Soft Solder.

IT is often very convenient, and, in fact, sometimes necessary, to have soft solder which will flow at different degrees of temperature. Many instances occur in which jobs cannot (in the country) be done by a professional jeweler, consequently the watchmaker is expected to do whatever nobody else can; and he must often run the risk of spoiling work by subjecting it to too intense a heat, whereas, if he had a little easy-flowing soft solder, there would be no danger.

From the following table you can easily prepare such as you wish—if only a little of some of the sorts; it will be found convenient:

No. 1.	1	part	Tin,	25	Lead—	Melts	at	580° F.
2.	1	"	"	10	"	"	"	541
3.	1	"	"	5	"	"	"	511
4.	1	"	"	3	"	"	"	482
5.	1	"	"	2	"	"	"	441
6.	1	"	"	1	"	"	"	370
7.	1½	"	"	1	"	"	"	234
8.	2	"	"	1	"	"	"	340
9.	3	"	"	1	"	"	"	356
10.	4	"	"	1	"	"	"	365
11.	5	"	"	1	"	"	"	378
12.	6	"	"	1	"	"	"	381
13.	4	"	"	4	" 1 pt.	Bism'th		329
14.	3	"	"	3	" 1	"		310
15	2	"	"	2	" 1	"		292
16.	1	"	"	1	" 1	"		254
17.	1	"	"	2	" 2	"		236
18.	5	"	"	3	" 3	"		202

No. 8 is the common tinsmith solder. No. 7 is the most fusible, unless Bismuth be added. No. 18 will melt at 122°, by the addition of 3 parts of mercury. The most convenient form for using soft solder is to have it in wire. It is very easy to have it in that form; for when you have it melted in a ladle, in pouring it out on a flat iron or stone you must trail it—that is, draw your ladle along so as to flow out on the stone a thread of metal. With a little practice you cannot but succeed. Any of these alloys will flow with the ordinary soldering fluid.

Another convenience for soft soldering is not as much used as it might be, and would save injury to many a job; that is, a soldering iron, the same as a tinsmith's, only minuter. A piece of copper wire, an inch long, and one-fourth inch thick, filed away almost to a point, with a wire handle about four inches long, terminated by a bit of wood or cork. In using, heat the copper in the lamp flame by laying it across something, to save time, and when hot enough to melt the solder, touch the end into your pickle, which will brighten it; then touch it to a bit of solder, and it will instantly take it up. Then you can apply it at any point you wish, without heating the balance of the article in hand.

MUCH interest has been excited in scientific circles by a very perfect piece of mechanism, invented by Commodore Dimple and Mr. Sloane. The weight of the pendulum consists of mercury contained in a glass vessel suspended by a steel rod. When by heat the rod elongates and tends to make the pendulum move slower, the expansion of the mercury in the glass vessel causes a rise in its center of gravity; and as mercury expands some ten times more than steel, a mercurial column of a height about one-tenth of the length of the steel rod will compensate its expansion and cause the center of oscillation to remain always at the same distance below the point of suspension. Every time the pendulum vibrates, its lower point, made of platinum, passes through a globule of mercury, and this contact establishes a connection with a voltaic battery, arranged in such a way that every time the contact is made a ratchet wheel with teeth will move one ratchet and produce a rap. At the tenth ratchet a platinum arm dips into another drop of mercury, making a circuit with another sounder giving a louder tap, so that every ten seconds the louder tap helps in counting the number of seconds. It is stated that by this arrangement an observer is enabled to rate chronometers to half a second, and by continued ratings the computation of errors may be reduced to an infinitesimally small fraction.

Revival of Antique Jewelry.

BY ALESSANDRO CASTELLANI.

ANTIQUE ornamental objects may be divided into two classes; namely, articles for daily use, and those for funeral purposes. The former are massive enough to be worn for years without suffering the slightest alteration, while the latter, destined for tombs, are exceedingly frail. We are astonished at the delicacy of workmanship, and often unable to imitate it. Both kinds belonging to the flourishing period of the goldsmith's art are of pure gold, but diminish in value as soon as they bear the character of certain Eastern importations, or represent designs which already point to the decadence, beginning with the Roman Empire. Antique work widely differed, however, at all times from the present productions of Europe; and modern jewelry compared with antique is less artistic and more mechanic. The different technical processes, such as enameling, polishing, and stone-setting, are now divided among various workmen, and the whole is generally under the direction of a maker whose object is to turn out a salable article, intended to catch the eye, and not to create a work of art. The precious metal employed in antique ornaments is, however, fully eclipsed by the beautiful workmanship, be they of Greek or Italian origin. The hand of the ancient artist, while bringing forth embossed figures and ornaments, or tracing with perfect symmetry the fine lines of minute granulated and thread work, or flowers and meanders, was guided by the highest ability and taste. These different processes he combined with an ease enabling him to subdivide his work to the utmost without injuring the elegance and strict unity of his original idea. It appears that the ancient goldsmiths were acquainted with and made use of chemical and mechanical agents which are unknown to us; they could separate and join particles of gold of such extreme minuteness as to be scarcely visible to the naked eye. Our modern workmen have not yet attained this perfection and the modes of melting, soldering, and wire drawing of their ancient brethren remain still a mystery.

On examining Greek and Etruscan granulated work, we must confess that the ancients, independent of elegance of design and engraving, were vastly our superiors in this branch of art. Among the native Hindoos, we find goldsmiths of the real antique type and leading a nomad life like their forefathers. They carry their tools with them and set to work wherever employment is offered. Sometimes they remain with a rich nabob or rayah, and with their customary perseverance, assisted by a small bellows and a few of the most primitive tools, they transform gold coins, after the old national tradition, into grainy filigree ornaments, which bear a striking resemblance to the antique productions. These Indian jewelers gave us an idea how the old Greek and Etruscan goldsmiths executed their work, and it is probable that the latter also worked with the greatest freedom, assisted only by few and inadequate tools, rather following their good traditions and never-failing taste, and that they were not only workmen but also artists.

After resolving the revival of the antique school, our first object was to discover the processes by which the ancients worked. We observed that their ornaments, except those intended for funeral ceremonies, instead of owing their raised parts to chiseling or engraving, were formed by separate pieces brought together, placed one upon the other, and fixed by soldering on some chemical manipulation. This, in my opinion, gives it so peculiar and marked a character, derived rather from the realization of the spontaneous idea and inspiration of the artist, than from the regular execution of the workman. Its very imperfections give to the workmanship that artistic character altogether wanting in the general number of modern works, which are usually produced by punching and casting, and that charm which so constantly strikes us in the work of the ancients. The first problem, then, that offered itself to our attention was the means of soldering together with the utmost neatness and delicacy, so many pieces of extraordinary thinness. Among others, those of almost invisible grains, like the pearls, which play so important a part in the ornamentation of antique jewelry, numerous assays, employing all possible agents, and the most powerful dissolvents to compose proper solder. We consulted the writings of Pliny, Theophilus, and Benvenuto Cellini, and neglected no other sources of instruction with which tradition could furnish us. We studied the works of Indian jewelers, and those of the Maltese and Genoese, but it was only in a remote corner on the Umbrian frontier, at St. Angelo, in Vado, a little district hidden in the recesses of the Apennines, far from every center of civilization, that we still found in use some of the processes employed by the Etruscans.

There yet exists in this region of Italy a special school of traditional jewelry, somewhat similar—certainly not in taste or elegance of design, but at least in method of workmanship—to the ancient art. The beautiful peasant girls of these districts when at their wedding feasts wear necklaces and long ear-rings called *naricelle*, much resembling the antique in workmanship. We then procured from St. Angelo, in Vado, a few workmen to whom we taught the art of producing Etruscan jewelry. Inheriting the patience of their forefathers, and caring nothing for those mechanical contrivances by which the geometrical exactness is attained in modern jewelry, these men succeeded better than all who we had previously employed in the imitation of that freedom of style which is the peculiar characteristic of the art among the ancients. Among the workmen of St. Angelo we mention with pleasure the master of this traditional art, Benedetto Romanini, our first pupil.

The events of 1848 interrupted our researches: works of art were made to symbolise patriotism, and as we produced and sold many objects of that character, our models found their way over Italy and other countries. When, however, darker times settled over our country, these hopeful prospects soon vanished, and many causes, which we cannot here mention, obliged us to discontinue our labors. Bad times followed, and it was not before 1858 that we were enabled to recommence our task, and need scarcely mention that we took it up again with renewed vigor, and endeavored by the revival of old traditions and every other means in our power, to reclaim that high repute which Italian art once justly commanded. Etruscan, Greek, and Roman jewelry became again the chief subjects of our studies and of carefully executed imitations. On comparison it will be noticed that Etruscan granulated work is distinguished by its extreme delicacy; that of the Greeks by its elegance, lightness, and symmetry of form, with a certain freedom of style in the application of enamel, and in modeling the small figures of gods; while manly beauty, recognizable in broader forms and greater solidity, are the chief characteristics of the Roman school.

The excavations and discoveries of Cumæ, Ostia, and Kertsch, in the Crimea, afforded fresh bases to work upon, and helped us to ascertain that works, hitherto regarded by antiquarians as of Greek origin, belonged in fact to the Etruscans; while others, attributed to the best times of imperial Rome, were recognized as originating from the earliest period of the Empire, or from distinct colonies. In imitating old Roman jewelry we found no difficulties, but that of the Etruscans and Greeks required much patient labor. Innumerable trials were made before the granulated work and the different enamels could be produced, and it is not long since we discovered (while examining an Etruscan ornament in our own collection through a magnifying glass) that the spots from which the granulated work had been broken off presented the same appearance as the gold surface previously covered by enamel. This discovery taught us a method of "granulating," which modern goldsmiths had till then declared inimitable. We were enabled to announce that we had solved the best part of a problem on which our attention had been bestowed for nearly twenty years. Gratifying as these results were, they did not satisfy us, because we had not yet gained that perfection which distinguishes antique ornaments. We were bent on further discoveries, and after the most laborious researches, we also mastered the Phœnician and Greek modes of granulating. We were no less anx-

ous to arrive at a true issue in reference to the ancient modes of enameling, and will briefly communicate the result of our experiments. Formerly, the general belief was that the art of enameling on gold was unknown to the Egyptians, Etruscans and Greeks. We have only few specimens of Egyptian workmanship bearing traces of enamel; and the beautiful objects found in Thebes in the sarcophagus of Queen Aah-Hoteh, by A. Mariette, show no definite signs of its employment. The decorations and many colored bases of these ornaments, instead of being enameled, are of dice of various stones, and as Mariette assures us, the source of these stones is to be found in the immediate neighborhood of the tombs. All these pieces of hard and soft stone are cut separately to the different forms by the emery wheel, and were probably afterwards set in so many *cloisons* or cells of gold by other substances unknown to us, so as to form borders on the feathers of holy birds and other religious emblems, all of rough and truly Egyptian design. From these Egyptian productions originated, no doubt, the Lombardic, Gothic, and Anglo-Saxon dice decorations in precious stones, and perhaps also the cloisonné-enamel of the Byzantine artists. Among all the works in gold of Egyptian origin known to us are only two examples of the use of enamel; one in the Campana Collection representing a bird with open wings and a human head; the other, and very similar one, is at the Louvre Museum. It is, however, uncertain whether even these ornaments are really of Egyptian workmanship or not; but if so, they no doubt belong to a period in which Greek art had already spread over the country of the Pharaohs. The use of enamel among Egyptians must therefore remain a doubtful question until some more convincing proofs are at hand.

Far different is it with the Greeks and Etruscans, and we could enumerate a long list of Greek and Italian enameled ornaments contained in various cabinets of Europe. It must, however, be stated that the ancients were very sparing in the application of enamel, as if afraid of covering too much of the beautiful natural yellow of pure gold with the colored glassy substance. Gold was then very rare, while these gay coverings were comparatively plentiful, being already used in the manufacture of vases, cups, amulets, and necklaces. The Greek and Etruscan objects left to us show plainly that the makers were perfect masters of the art of enameling, and that its scanty use is due, as already mentioned, to a natural aversion of hiding too much of the gold's splendor. Besides, it may well be supposed that artists who could control the fire so well as to solder the minutest grains of gold, and spin gold threads of extreme fineness, and who obtained by chemical agents so many kinds of transparent and opaque enamel, were not ignorant of covering a gold surface with that substance. Numerous and convincing proofs remove all doubts on this head. We cannot help admiring the good taste which guided their employment of enamels, not only in the choice of colors, which are mostly light and delicate, but in the general application producing an harmonious whole. The enamel is generally laid in small cells of wire, forming handsome designs, and often used to cover the bodies of small mythological birds. In these cases the effects are splendid, the dazzlling white and the delicate shades of green and blue are so beautiful as to cause the envy of modern enamelers, the Hindoos excepted, who are still far advanced in this branch of art.

Among the principal objects in granulated gold of Greek and Etruscan source, we may mention the magnificent crown in the Louvre Museum and the necklace of Milo in the British Museum—works which we have copied. Special mention may also be made of the dice in beautiful enamel work, the ear-rings with cocks, parrots, little dogs, etc., the two necklets with butterfly clasps, all found in Vulci, and forming part of our own collection of antique jewelry. With the Arabian element, which became scattered through the whole Roman world, the art of enameling, so much favored by the Eastern nations, also spread and gave rise to the famous schools of Venice, Limoges, and Florence. Their respective types are well-known. Jules Labarte, the learned archæologist, in whose writings the art of enameling in the early and middle ages is fully treated, calls attention to the specialty hitherto unnoticed. This is a sort of transparent cloisonné-enamel, often mentioned in the inventories of Merovingian kings. Labarte says that this kind of enamel was used in those days in the manufacture of certain royal drinking cups only; and it was, no doubt, very suitable for this purpose, as the transparent and lively colored decorations of geometrical patterns could be seen while drinking. He adds that up to the present time he has not been able to discover a work of this kind; but as a proof that it did exist and that it was highly valued, he refers to the writings of Benvenuto Cellini, where the Florentine jeweler states that Francis I. showed him a goblet of this sort, and asked his opinion as to its probable mode of production. Modern jewelers, encouraged by Labarte, bestowed their attention to this lost art, and we are glad to say that we have mastered it also. Several of our trial productions submitted to this celebrated archæologist met with his entire approval, and he recognized in them all the lost characteristics of the Merovingian enamels.

For some time we have also devoted our attention to mosaic-work. At the period at which we began this branch of decorative art, most workmen in that line were unoccupied, and the few articles produced were unimportant—mostly copies of modern designs, without taste and artistic value. We were the first to apply mosaics to classic jewelry, and our models were copied everywhere. Thus we went on indistinctively, without knowing whether the ancients ever used mosaics for personal adornment or not. Some time afterwards we had, however, the pleasure of beholding an ear-ring in the Neopolitan Museum, a relic of the best Greek period, and ornamented with small pieces of colored mosaics applied in the very style we had adopted for our modern jewelry. The discoveries in the Basilica of St. Alexander and in the Roman Catacombs made us desirous of imitating some of those Christian works, which, though rude in design, were still remarkable for their simplicity. We decided on copying some of the best mosaic work in the old Roman Basilicas on a small scale, and for our success herein we are greatly indebted to Count Oulsoufieff, well-known for his vast knowledge of Greco-Oriental art. Unfortunately, he did not live long enough to enjoy the results which he was so instrumental in bringing about. We have also succeeded in producing some satisfactory niello-work.

Thus, after years of careful study and innumerable experiments, we were enabled to reproduce the best models of the worthy masters of our art. We devoted our attention to the Etruscan, Italo-Greek, pure Greek, and Roman schools in succession, and these were followed by imitations of Christian and Byzantine models. The success which attended our endeavors encouraged us to try the Italian Renaissance, and we have also been enabled to revive the works of the leading artists of that period; especially those of Benvenuto Cellini. Comparatively few relics are left to us from the Renaissance, the great value of the precious stones used in ornamenting them, doubtless occasioned their scarcity. Our models would therefore have been very limited were it not that the contemporary painters preserved the ornaments of the period with such fidelity as to allow correct imitations. Our labors ended with the Italian Renaissaace, as the goldsmith's art has not since produced anything new deserving special attention.

PROF. MEYER, in a brief essay on a new and simple method of determining the number of vibrations of sonorous bodies, said that the seconds' beat of a clock can be made by electricity to send a spark through the metallic foil, thus burning a hole in the smoke blackened sheet at each interval of time. The line made on the sheet by the foil is sinuous, and shows the number of vibrations between the second-holes, by the intervening number of sinuosities or waves. But the new contrivance is much simpler, as regards the measurement of time. It is a kind of syren, made simply by punching holes near the edge of a circular card, and setting the card in revolution. While the card is going round, it is only necessary to hold a pipe opposite the holes. The note sounded by this pipe determines the rate of re olution. This method can be easily adopted in lieu of using a seconds' clock, and gives results that are nearly accurate, with very little cost or trouble.

Workshop Recipes.

Vulcanite, when placed in a bath of nitro-benzine, becomes, at the end of four of five weeks, soft and flexible, and may be fashioned into any design.

Carbolic Acid on Metal Cutting Tools.—Carbolic acid is recommended for moistening the tools with which tools are worked. The duty of the grindstone is even said to be increased by the use of the acid. The dark and impure acid can be used for this purpose.

Soldering Cast Steel.—The material employed is pulverized white marble. The two pieces to be soldered are simply heated, rolled in the marble dust, then quickly placed one in the other and hammered. This recipe is due to M. A. Fiala, an eminent mechanician, of Prague, and was communicated by Mons. G. Bertrand to the *Revue Chronométrique*.

To Frost Watch Moyements.—Cover the parts to be frosted for 10 or 15 minutes in a compound of nitric acid, muriatic acid, and salt, of equal parts, say one ounce of each. On removing the article from the mixture, place it in a shallow vessel, and immerse it in some beer, scour thoroughly with a fine scratch brush, keeping the article immersed in the sour beer. Wash off first in clean water, and then in alcohol. Gild or silver in the ordinary way.

Microscopic Crystals may easily be obtained by placing on a warm watch-glass a drop of the concentrated solution contained in a second watch-glass, a thin film being thus obtained. The upper glass should not be pressed, but allowed to rest of itself. The drop thus expands into a film; and if a few drops of ether be placed in the upper watch-glass, the cold resulting from its evaporation will cause crystallization to take place between the two glasses.—*Journal of Chemistry*.

To Dye Wood Ebony Black.—M. Lauber, of Paris has discovered a mordant for this purpose, which has the especial advantage of being applied cold. This mordant, or dye, is composed of an extract of campechy, of pyrolignite of iron, and a little free acetic acid. It is prepared by dissolving the extract of campechy in boiling water, till the solution marks 10° B., then mixing 5 litres of this solution with 2½ litres of pyrolignite of iron marking 18° B., and ½ litre of acid marking 2° B. This mixture is heated for a quarter of an hour, and the dye is then ready for use.—*Revue Chronométrique*.

Mending Vulcanite Chains.—Watchmakers are often asked to mend the broken parts of vulcanite chains. If an attempt is made to open them cold, the link will in nine cases out of ten snap, especially stout ones; and if they do not break, the end spring opened, will not again close. Heating by candle or fire will burn them, but, if held over the chimney of a kerosene lamp, they will in a few seconds become so soft that you might pull them straight, and shut them up again or close as when new, without injury to shape or polish. Horn or tortoiseshell may be treated in the same manner.

Engraving on Glass.—Some of the interesting effects recently obtained by M. Planté with his secondary batteries have suggested to him a new mode of engraving on glass. The method he adopts is this: A plate of glass or crystal, in a horizontal position, is covered with a concentrated solution of nitrate of potash. Into the liquid layer, and along the edges of the plate, is introduced a horizontal platinum wire connected with a secondary battery of 50 to 60 elements. Then, holding in the hand the other electrode, formed of a platinum wire, sheathed, except at the point, with insulating material, you touch the glass with it at the parts where the characters are to be reproduced. A luminous track is produced wherever the electrode touches, and the lines are found to be distinctly engraved on the plate. The more slowly the thing is done the deeper are the lines, and their width depends on the diameter of the electrode. Either electrode may be used to engrave with, but a less strong current serves for engraving with the negative electrode. Any source of electricity, of sufficient quantity or tension, would serve for the purpose, *e.g.*, a Bunsen battery, or a Gramme machine.

Solution for Producing High Brilliancy in Silver Work.—Cream of tartar 30, sea salt 30, sulphate of alumine and potash 30, water 1500. Boil the articles in this mixture.

"Many Watchmakers," says the *Revue Chronométrique*, "when they have a spiral to straighten, or close up, simply place it flat on a piece of paper or an ivory surface; but the shadow thrown by the spires frequently renders the shape of the spirals Indistinct, and does not permit of the distances between the spires being properly judged. A Parisian watchmaker overcomes this difficulty in a very simple manner: he places a watch glass on the bench, the higher the glass the better, and puts the spiral he wishes to repair upon it. The light from beneath causes the troublesome shadow to disappear and every part of the spiral to be clearly seen."

Main Springs.—When a main spring is cleaned most inexperienced workmen will take hold of one end and pull the spring about half its its length straight out, to save time. This practice will break springs when nothing else will; and springs treated thus generally break after the watch has been delivered to the customer only a few days. Breaking into many pieces is owing to the acid in the oil which is used. We will suppose the mainspring is a fine one, and has been evenly tempered and properly cleaned; if, now, old oil is used, or that of an inferior quality if fresh, the acid it contains will eat into the spring and will finally destroy its texture. The coil nearest the center breaks first, and as it recoils it breaks every coil in the barrel, and sometimes each coil is broken twice. The spring has become so impregnated with acid that it has no life left.

To Impart a Fine Gold Color to Jewelry.—Boil 8 ozs. saltpetre, 4 ozs. alum, and 4 ozs. common salt together in a porcelain or other fireproof vessel (not metallic) in barely sufficient water to dissolve them; add 9 ozs. strong muriatic acid to this solution, and filter. This quantity will be sufficient for coloring 4 ozs of work at a time, and should be kept in a well stoppered glass bottle when not in use. Another recipe for the same purpose is: Boil 10½ ozs. saltpetre, and 5¾ ozs. common salt together, in a porcelain dish, in a quantity of soft water barely sufficient to dissolve them, and ⅛ oz. nitrate of silver, and 9½ ozs. muriatic acid, and filter. This quantity will also be sufficient for 4 ozs. of work at a time, and should be kept as the previous preparation when not in use. To color with either, anneal the work twice and boil it, each time after annealing, in a pickle consisting of 8 parts water, and 1 part sulphuric acid. Then pour a sufficient quantity of the coloring mixture in a porcelain dish, and heat it to about 150° Fah. Hold the work in this for about two minutes, then take it out and rinse it in clean water. If not enough colored to suit, the process must be repeated until the desired color is obtained.

To Restore the Color of Nickel Movements.—Correspondents of the *Journal Suisse d'Horlogerie* recommend the following methods: Take 50 parts of the rectified spirits of wine, 1 part of sulphuric acid, and one part nitric acid. Dip the pieces for about ten to fifteen seconds in this composition, tnen dip them in cold water, and afterwards in rectified spirits of wine. Dry them with a piece of fine linen, or in wood dust. Nickel, and the majority of other metals which are liable to tarnish, may be restored to their primitive color by dipping them in the following bath: Dissolve in half a glass of water 6 or 7 grammes of cyanide of potassium, plunge the pieces in this solution and withdraw them immediately. As the cyanide mixes well with water, it is sufficient to rinse them at once in the latter to destroy any traces of the cyanide. After this, dip the pieces in spirits of wine, and dry them in boxwood dust in order to keep them from rusting. Balance even, with the spirals fixed may undergo this operation without any danger. If the pieces to be restored are greasy, they must be cleaned with benzine before being dipped in the cyanide, because it will not touch grease. As cyanide of potassium is a violent poison, great care must be exercised and the operation should be performed in a well ventilated place. The same bath preserved in a bottle may be used for a long time.

Trade Gossip.

Swiss watches, imported during the week ending March 23d, amounted to $81,300.

Semi-translucent stones are again worn, after having been out of fashion for nearly ten years.

Jaques & Marcus have succeeded the old and well-known firm of Alex. Rumrill & Co., No. 41 Union Square.

Mr. Henry Beach, for many years with the Wilcox Silver Plate Co., has associated himself with the Derby Silver Plate Co.

Novel pocket-books have a small silver plate on the outside, which when moved by the spring, displays the picture of the owner.

L. McIntosh, for many years in the jewelry business at Pittsburgh, died on Monday the 25th ult., after a short but painful illness.

Mr. Henry Ginnel sails for Europe in the *Sythia*, leaving this port May 2d, and expects to return in August with his son, who is being educated in Switzerland.

Phillippe de Valois, of France, was the first to grant to the silversmiths of France the right of forming a corporation. Their motto was : *In sacra inque coronas*, (among the sacred vessels and the crowns).

Augustus Putsch, a jeweler doing business at Winona, Minn., attempted to end his life by shooting himself with a revolver, on the evening of the 15th ult. Mental derangement, caused by religious excitement, is said to have been the cause of his rash act.

The trade of articles in real bronze, in these hard times has been superseded by those made in articles of earthenware, brass and iron, the shapes and colors of which are better suited to the present taste in house decoration, while they make a good deal more show for the money.

The Meriden Britannia Company manufacture a new table bell, composed of two metallic gongs placed together, forming nearly a sphere. The impulsion given to a small knob on the outside sets a circular clapper in motion, which striking irregularly, produces a singular but agreeable sound.

The tinted marble figure, by Rosetté of Rome, now on exhibition at Tiffany's, has brought more people to their store than any other piece they have ever shown. The effect of the veil over the head is exquisite, and it seems impossible at first to realize that it is only marble and not *tulle*.

A reproduction of some of the most exquisite pieces from the Cesnola collection, has been made with excellent skill in the workshops of Messrs. Tiffany & Co. They are now on their way to Paris, and will hold their own against the best reproductions of antique jewelry made by Castellani and others.

The term *bric-a-brac* comes from the old French expression, *de bric et de broc*, meaning from right to left, from hither and thither. *Bric* is derived from the word *bricoler*, to fix (in its American sense), and *broc-brocanter*, to trade. This word having most likely the same root as the English words to *broke* and *broker*.

The secret of the manufacture of porcelain in China, was first revealed to Europe by a letter from the Pere d'Entrecolles, a Jesuit missionary, in 1512, but it was a long time afterwards that the two ingredients of it, *kaolin*, or white clay, and *petunzé*, or Feldspar rock, were discovered and used for manufactures.

There is a decided movement (up town) among bronze and fancy good dealers. A. M. Hays & Co. will open in Union Square, and there is some talk about the house of Ve. J. Magnin, Guédin & Co., following suit. After sewing machines, bronzes are invading the Square, Washington and Lafayette will be "*en pays de connaissance.*"

A few days ago an intelligent and neatly dressed negro entered the office of H. D. Merritt & Co., 12 Maiden Lane, and while looking at some plated chains succeeded in secreting nineteen of them. The theft was discovered soon after the fellow's departure. The loss was reported to Officer Robinson who arrested the thief as he was entering the office of another jeweler, where he intended to play the same game. He was taken to the Tombs where he pleaded guilty and was sentenced to Sing Sing for five years.

The wonderful clock in South Woodstock, Vt., which has puzzled people by starting up at unexpected periods, running briskly awhile and then coming to a standstill, has been examined, and found to be of peculiar make. Its motive power is supplied by a mainspring instead of weights, and its eccentricities have been proved to be the result of its strange construction, and not of spirit interference as was at first supposed.

An association of American painters on tiles has been formed; it is composed of some of our most promising artists, but limited as to the number of membership. They meet once a week, in the evening, at the studio of one of the members, and paint tiles, which are afterwards baked. Each member in turn defrays the expenses of the evening (lager, cheese and tobacco), and receives as a gift the artistic production, which he disposes of as best he can.

Prof. J. E. Bassett, of French Broad, N. C., who is now in Wetumpa, Ala., has a diamond not only of enormous size, but remarkable purity. It was found by his wife on the bank of the Coosa river, just below the falls within the corporate limits of Wetumpka. As soon as the professor exhibited the stone he was offered $10,000 for it. He had the stone examined by a watchmaker and jeweler, who pronounced it intrinsically worth $75,000.

A most singular trait in the character of Oriental populations is their love for automatic or mechanical contrivances, as far back as the reign of St. Louis of France, a French mechanic named Guillaume Boucher was employed by the Khan of Tartary to make a mechanical fountain for him. In 1859, at the "Loot," the summer palace, several hundred watches, with automatic movements, were found, and, to the great regret of the august monarch, taken away. Most of them found their way to Tiffany & Co.'s store, where some of them may still be seen.

A few days ago a fashionably attired lady entered the establishment of Messrs. Canfield Bros. & Co., Baltimore, and asked to be shown some diamond rings ; after examining them she withdrew, expressing her intention of calling again. Shortly after her departure the salesman discovered that two large diamond rings, worth $1,200, were missing and two smaller rings, worth $50, substituted. Intelligence of the robbery was communicated to other jewelers, and, shortly after, the suspected person was arrested at Janowitz's jewelry store. The fair prisoner was subsequently released in $3,000 bail.

Professor T. Edison's talking machine registers speech on pieces of tin-foil, which can be placed in the machine again at any time and repeat the words once spoken. This will not be without effect on the jewelry trade, for lockets will soon have to be designed in which pieces of tin-foil registering sweet vows can be preserved. In case of love gold-foil can be used instead of tin. Perhaps we may see the "charity bangle" superseded by the "phonograph bangle," to which a small speech reader will hang. By placing it near her ear and turning a diminutive crank, Arabella will be able to hear her own George's voice whispering, "I love you dearest," while he may be saying the very same thing to the girl over the way.

Some fifty years ago two clockmakers, Phillips and Brown, resided at Hopkinton, N. H. The former spent $8 for a ticket in the Havana lottery, but growing weak-hearted ere the drawing took place, sold it to Brown for $4. Brown vainly endeavored to sell it to a farmer for a $2 load of hay, and had it when it drew a prize of $25,000. The money reached him in due course, and Brown nearly lost his wits. For the first two nights he fancied that robbers were prowling round the house; he took the money to the woods in the dark and hid it in a hollow tree. When he came to look for it the forest bore by day so different an aspect that he could not find the hiding place he had chosen, and it was not till some days later that the almost distracted man chanced upon his treasure. With it he finally made investments in real estate which did not prove remunerative as far as concerned himself and family, and in a few years his $25,000 dwindled away, and he was not as well off as he would have been had he never drawn the prize.

THE

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To the Trade.

This journal is published on the 15th of every month, and will, on receipt of the yearly subscription of $2.00, *be forwarded regularly to any address in the United States or Canada for twelve months. The present volume commenced with the February issue, and intending subscribers can be supplied with back numbers so as to have the volume complete.*

The North and the South.

THE Southern States are beginning to present once more an appearance of prosperity, and offer again a field for the manufacturers and jobbers of the North to cultivate. Before the war the South was one of the most liberal patrons of Northern industry. Her people devoted their attention more to agricultural than manufacturing enterprises; they were the producers of many of our staple products, and the consumers of the products of our industrial classes. After the devastations incident to four years of civil war, and nearly four times as many years of "reconstruction," the South is once more getting back to her normal condition. That matter of "reconstruction" was a difficult problem to solve, and errors were committed by both the North and South which tended to delay the good work all had in view, and to prevent that restoration of "peace and good will" which every one so much desired. This much wished for harmony of interest and feeling was interfered with by that pestilent brood of politicians whose personal welfare and ambition were gratified by stirring up strife and keeping alive the elements of discord. These were the so-called "carpet-baggers," from the North, and the professional politicians of the South. There was a natural hostility between these two elements, and in their efforts to obtain political supremacy, they contrived to embroil the sections in continuous strife. During the past few years, however, there has been a marked improvement in this respect throughout the South. The negroes, that everlasting bone of contention, finding they could not live by devoting their time to the discussion of political questions they did not understand, and that the government did not propose to give each one "a farm and a mule," have very generally "accepted the situation" and gone to work. As the negro has become less prominent, the politicians have grown less noisy, a comparative calm has followed the storm of fierce contentions, and all classes seem now intent upon securing a business rather than a political reconstruction. The white population, naturally unsettled by the abolishment of slavery, has turned its attention to business pursuits as a means whereby to live. Having lost their main possessions as a result of the war, they have set to work to carve out fortunes for themselves by their own energies and talents. Politics, as a business, is ignored by the masses, who are intent upon only providing for themselves by their own industry. Northern "carpet-baggers" and Southern "hot-heads" are alike ignored or regarded with very general contempt as the disturbing element which has for many years delayed Southern prosperity.

All reports from the South indicate that a much larger area of land will be cultivated this year than there has been since the war. The crops of last year were excellent, and the prices obtained for them unusually good. As a consequence, a better feeling prevails in all sections. Northern business men can do much to promote this feeling. However strong the war sentiment may have been among us, the fact is now recognized that the war is over, and that what remains to be done is to restore the business relations which formerly existed between the two sections. We have among us, as they have at the South, a few turbulent professional politicians whose stock in trade consists of dead issues; but these no more represent the true sentiment of the Northern people, regarding the South, than Bob Ingersoll represents their religious views. Both the infidel and the politician have a few followers, but neither has weight with the intelligent masses. Business men of all sections are anxious to see the most perfect harmony existing among all classes, and denounce, with unmeasured terms, those who seek to foment dissensions. Politics is a trade that enlists but few followers, while business enterprises and industrial affairs occupy the attention of the majority. The success of these latter depends upon the prosperity of all sections, and none will rejoice more than Northern business men to see the South rehabilitated with all her ante-bellum elements of success and prosperity.

As the South once more bends her energies to industrial pursuits, her credit is being restored. There is no denying the fact that the repudiation of some of the Southern States affected the credit of individuals, but, as individuals have largely repudiated the honesty of those States, and have taken pains to maintain their own business standing, the effect has been to allay the natural suspicion excited by State action, and to place the Southern business community on the same footing as that occupied by business men of other sections. Dealers from the South can come to the Northern cities to-day and buy goods upon the same footing and under the same conditions as the dealers of the West can. No discrimination is made against them on account of what has occurred in the past; on the contrary, owing to the disorganized condition of things that has heretofore existed, it is evident that our business men are making unusual efforts to aid the business men of the South in putting their affairs in a more prosperous condition. After the prolonged season of depression which

has characterized all branches of trade and commerce, it is apparent to everyone that unusual exertions must be put forth to restore that prosperity which existed previous to the panic of 1873. It is evident that the worst is over; capital that has been so timid during the financial storm that has raged in all sections, is becoming less conservative, and is boldly seeking new avenues and fields for investment while many are looking abroad to the markets of foreign countries for enlarged opportunities for trade, others are seeking, by every honest endeavor, to revive the home demand for foreign productions. The factories of the East and the West respond with busy hum to the revival of the industrial efforts being put forth by the South, and on all sides there are indications of renewed activity in all branches of trade. With this naturally comes a renewal of confidence, and an earnest desire among all classes to help each other. Capital is less distrustful of manufacturing enterprises, and the credit of the retailers has risen in the estimation of the manufacturers. Whoever shows fair business prospects, and ordinary business capacity, can obtain all the assistance he requires to enable him to carry on almost any enterprise in which he chooses to engage. There is an evident determination among all classes to achieve prosperity through the legitimate channels of supply and demand, the only possible means by which it can be made permanent.

We wish to impress these facts upon the minds of business men of the Southern States. Whatever misrepresentations have been made to them by their scheming politicians and ours to the contrary, the fact remains that the business men of the North are not only anxious to see them once more in a prosperous condition, but are willing to aid them in the accomplishment of such a result. They cannot forget that the South was at one time one of the most liberal buyers of Northern products, and that one of the causes of the hard times of the past few years has been the prostrate condition of the South. Whatever differences of political opinion may have existed, they have not prevented business men of the North from sympathizing with those of the South in their loss of property, and in their efforts to recover from the misfortunes and devastations of war. Now that there is a prospect that they are to be relieved from the incubus of political strife, which has done so much to demoralize them, that sympathy is ready to take on a practical form, and aid them to the fullest extent in their endeavors to rebuild their fallen fortunes.

While we speak thus in behalf of business men in general, in the full confidence that we give truthful utterance to their sentiments, we know most positively that we speak the sentiments of the jewelry trade. That trade lost heavily at the outbreak of the war by reason of its large credits in the South; but that fact, so far from impairing its faith in the integrity of Southern dealers, was looked upon as a small portion of the misfortunes of war and was accepted as such. They have watched the earnest struggles of the Southern dealers to regain their former positions, and have deplored them with the dominance of the pestilence politicians. They now rejoice that there is once more a fair prospect of restoring the pleasant business relations that formerly existed between them. New York is the natural purchasing market for the Southern dealers in jewelry. Here are located the most extensive manufacturers, the largest jobbing houses, the greatest variety of goods characterized by the newest and most tasteful designs. Nowhere else are there such inducements held out to buyers. These advantages were fully appreciated in past times, and we can assure our Southern readers that they exist to a greater extent to-day than ever before; while thus commending our manufacturers to the South, we can, with equal confidence, assure the trade that the South now presents a favorable field for them to work in, in their efforts to extend the sales of their goods.

The Repeal of the Bankrupt Law

WE all have had sad enough experience with the Federal Bankrupt Law. We have all had enough of the compromises and swindles effected by rascally traders who threatened to go through the Court and spend the remnant of their assets on lawyers and officials if their offer of a percentage on their liabilities was not accepted. The creditor class of the country have been forced by the fear of bankruptcy proceedings to accept almost anything rather than assume the liability of assessments for expenses, and in the end find that they had thrown good money after bad; consequently they appealed to the Federal Legislature for relief, and their prayer has been granted with a vengeance. Perhaps the old law was beyond reformation, and is best entirely abrogated. At any rate it will probably be ere long a thing of the past. This being so, we will do well to contemplate the consequences of the repeal of the Bankrupt Law.

In the first place the laws relative to insolvent debtors will vary with the State, and the present system of compelling compromises will be replaced by a wonderful uncertainty as to whether the creditor has proved his debt, and whether the debtor has really been able to cancel his obligation. For a time at least a widespread ignorance will prevail as to what should be done to protect creditors, and in the end it is probable that they will find themselves out of the frying-pan of the bankrupt act into the fire of special State legislation.

It is to be feared that the Southern and Western States will set to work and frame special laws in favor of the debtor as against the Eastern creditor. The West and the South are always owing to the East, and past experience has proved that the extreme doctrine of repudiation has been deliberately contemplated by some of the weak financial States, and actually carried into effect in some instances. Here we may expect an unfair discrimination against the crediting Eastern States, and that few facilities will be extended to enable the capitalists of the Atlantic seaboard to realize profits out of the consumers in the interior. Nevertheless they can take their revenge when customers in arrears come East to lay in a new stock of goods.

In another view of the matter the creditor will be empowered to enforce his claim against the debtor, for the well known principle of State sovereignty applies, and a discharge from liability obtained in a State will be of no force whatever outside the boundaries of that State, unless the Eastern creditor came in of his own free will, and was a party to the proceedings. Hence the discharged bankrupt will be practically "on the limits" of his State, and liable to all the pains and penalties of the law if he is caught beyond his area of immunity.

Whatever legislative action may be taken in the future, we would strongly urge the incorporation of a scheme of graded certificates of discharge, such as that which prevails in England. Hitherto in this country the man who pays one per cent. comes out purged from his liabilities as completely as he whose estate realizes one hundred cents on the dollar, while the storm raised by suspicious circumstances and irregular bankruptcy soon blows over. This should be remedied, and different classes of certificates should be given in the discretion of the Court having cognizance of the circumstances. Then the unfortunate insolvent could begin again in business, assured of the confidence of his brethren in trade, while the swindler would be pretty well branded for the rest of his life. Then, too, there would be some satisfaction in fighting down compromises and fraudulent failures, and people would be more cautious in risking their reputations in attempting to swindle their creditors.

Traveling Auctioneers.

WE are in receipt of numerous complaints from retail dealers in the West and South regarding a practice which seems to be encouraged by a certain class of manufacturers. This is the sending through the country of stocks of cheap jewelry and plated ware, to be sold by auction in the principal towns and cities. We have before us a circular put forth by one of these traveling concerns, which announces the sale of the stock of a notorious bankrupt and "lame duck," whose numerous failures have destroyed his usefulness as a legitimate dealer, but who is stocked up with cheap jewelry, by manufacturers, and sent out on his peregrinations. He advertises "fine goods at your own

prices," and his list embraces cheap imitations of everything kept by the average retailer. This is but one of a number of these perambulating "lame ducks," with which the country is infested. Their low karat goods serve to deceive the masses, and to destroy the regular trade of the legitimate dealer. Of course, if the regular dealers are thus deprived of their trade by the manufacturers who keep up these traveling menageries, they cannot be expected to pay their debts. Thus the illegitimate practice referred to comes home to roost, and the manufacturers are in the end the losers. This would not be a matter of regret were the loss to fall entirely upon those who fit out these peddling auctioneers with their goods; but it does not; all manufacturers are involved in the loss of trade by the legitimate dealers, and the ruin of the latter means loss to the former. It is difficult, however, to see how this kind of business is to be prevented. There are manufacturers who are unscrupulous enough to resort to anything that promises present gain, regardless of the consequences, to themselves or the trade in general. They are constantly devising ways and means to work in an underhand manner, and would not be satisfied to walk in the paths of legitimate trade, even though the profits were larger. The only remedy which the retailers have is to spot every manufacturer who indulges in such disreputable practices, and to avoid all dealings with him in future. No one ever successfully accomplished the feat of carrying water on both shoulders. The manufacturer who deliberately sets to work to kill off the retail dealers cannot expect long to enjoy their confidence or patronage. The retailers are the life of manufacturing, and the man who killed the goose that laid the golden egg was no more foolish or idiotic than are the manufacturers who compete with the retailers—destroying their trade. and depriving them of the ability to pay their debts. This practice, however, is scarcely less reprehensible than that of encouraging chronic bankrupts to continue in business—in competition with those who strive and expect to pay their indebtedness, dollar for dollar.

Our Commercial Conscience

PERIODICALLY an epidemic sweeps over the country, bringing disease with it and leaving death in its tracks. The mourners go about the street and men's hearts sink within them. No one has courage to call self-help to aid, and only the labor of time restores the condition of affairs as it was before the scourge. So it would seem that an epidemic of moral weakness had insidiously pervaded this business community. We have lost confidence in each other and so our hands are weakened and the wheels of commerce are clogged. There was a time, not long past, when the opposite evil prevailed. Then credit was inflated and men initiated operations far beyond their ability to maintain. Then we admired and imitated the "smart" man, we placed him at the head of our Pantheon only to find that we had installed as our idol—Mercury, the god of thieves. Now the reaction has come and we are suffering from the consequence of our commercial intoxication. So many of our compeers have schemed out of their liabilities by pleading poverty and offering a compromise that this moral dry rot threatens even honest men, who find it a hard task to pay in full when they themselves, are only half paid. We are in haste to get rich and the easiest road to wealth is found in liberal purchases, quick sales and a compromise payment. The end justifies the means and a dollar saved out of a debt justly owed is regarded too often as made squarely and honestly. There is danger that the nation will be cursed with a weak commerical commerce and in that case the outlook will be dismal and certain. We should fight against the increasing inroads of mercantile dishonesty, we should crush and punish every attempt we meet and repress in our own hearts the temptations which inevitably arise in every day life. Then in the end well-earned success will reward persistent and honoable efforts, and prosperity will come to those who have conquered the pure cussedness of the generation and eradicate commercial dry rot from their business life.

"Very Slow."

A LARGE majority of the retail jewelry trade of the country has been for a long time "very slow." The patience of manufacturers is becoming quite exhausted and there are already ominous signs that they intend to take matters in their own hands and cut off the chronic and hopeless cases. Recent and ample experience has shown that it is a positive wrong to nurse along a patient who refuses to lend his aid to work his own cure.

There are times when good men may require a little temporary assistance at settling day but when the debtor cannot pay in full at *any* time when an account comes due then it becomes a duty on the part of the creditor to firmly refuse this "furnishing of capital." What are the causes of so many good men being so slow? First and foremost—over buying; over half of the trade are carrying too much sail, too large stocks for the business done. During the war when business was good a large stock could be carried and turned quick and bills met when due; but during the past five years nearly every dealer has had a pride to let his townsmen see that he keeps as full a stock as ever when at the same time his sales are scarcely a quarter what they once were. And yet these dealers keep on buying and adding to the stock everything that is new. Next large expenses out of ratio to business is another canker worm; and the dealer, for fear of losing prestige has not the moral courage to face the music and move into smaller quarters and lessen his expenses. Crediting is the final and the grestest curse. No man ought to sell articles of luxury at retail on credit in hard times and it is a question whether it ought to be done in any times. There are prosperous jewelers who trust no one and they are to-day in a better position than those who have given long credits to force sales. There are in every town some of the first frmiles to whom it may be politic not to demand cash down, but on the first of each month let all such bills be collected let us reduce our stocks and work on our capital, purchase sparingly, sell for cash, cut down the expenses and we shall have no trouble about paying out bills. Let manufacturers promptly but fiamly inform the trade throughout the country that henceforth and hereafter they have goods to sell to those who will purchase only what they need and can pay for. But that they have no money to furnish as capital to carry excessive stock and credits with. When those happy days come "Too Slow" will have *died* of his own slowness.

The Balance of Trade.

THE foreign trade returns for the ninth month of the current fiscal year, (March,) show a gross importation of $39,000,000 against the export of $74,000,000 in domestic produce, etc., from the United States. This difference of $35,000,000, added to the previous favorable balance for eight months, raises the whole trade balance in favor of the United States since July 1st, 1877, to $207,000,000, or to be exact, $206,545,744. That this balance, as in the preceding fiscal year, has been largely drawn upon on the return home of United States bonds, there is no question. But the present sum is much larger than had been generally calculated upon at the close of the first six months of the fiscal year, January 1, 1878, when the silver agitation in Congress began seriously to increase the return of government bonds to this side.

The country has not felt the return of the bonds European holders have tired of, nor have we understood the resources of our people to absorb and to pay for their bonds. In the whole nine months the net loss of the precious metals is only $3,000,000. The exports of specie of both classes, mostly silver, were $23,000,000, and the imports of foreign specie $20,000,000. The production of the mines of the United States in the same nine months was little, if anything, short of $60,000,000, of which at least $40,000,000 has gone into the Treasury to remain there, as it does to-day, with the previous accumulation, ready for the resumption of coin payments.

Observatory Tests in Switzerland.

EVERY watchmaker has heard of the observations at Geneva and Neuchatel, and an account of the different tests to which chronometers and watches are submitted will be interesting to our readers.

At both places chronometers are divided into marine chronometers, hung on gimbals, which remain two months at Neuchatel and three at Geneva, and chronometer watches which are again subdivided into first class (which are tested during 51 days at Geneva and 42 at Neuchatel), second class (which are tested during 30 days at both observatories), third class (which are tested 16 days at Geneva and 15 days at Neuchatel.)

The following sets forth the different tests of the various grades which have just been enumerated.

MARINE CHRONOMETERS.

At Geneva the test extends over three months, as follows:

28 days in the hall of Observatory.
24 hours in oven.
24 hours in refrigerator.
28 days in hall of Observatory.
24 hours in oven.
24 hours in refrigerator.
28 days in the hall of Observatory.

The temperature in the hall of the Observatory varies with the seasons of the year, that of the oven ranges between 30° and 35° Cent.

The chronometer must comply with the following conditions of proof :

1st. The mean variation of going from day to day should not exceed one-half second, while the chronometer is in the hall of the Observatory.

2d. The error of compensation, being the variation for 1° Centigrade of temperature, as determined at the end of the first month by comparison of going in the oven and refrigerator, should agree to within one-tenth second of that determined by a like comparison at the end of the second month, and the mean of the two determinations should be less than one-fifth second.

3d. The three averages of going during each of the three months should agree with their mean to a second.

All details and variations according to temperature are shown in the report.

At Neuchatel marine chronometers are observed in changing temperature, and in an oven during two months, and should comply with the following conditions :

1st. The daily variation should not exceed one-third second.

2d. The variation for 1° (Cent.) of temperature should not exceed one-tenth second, and the previous rate should be resumed within one and a half seconds after the test of the stove.

FIRST-CLASS CHRONOMETER WATCHES.—GENEVA.

7 days vertical. Pendant above.
7 " " " on right.
7 " " " beneath.
7 " " " on left.
7 " Horizontal. Face down.
7 " " " up.
1 " in oven. Horizontal. face up.
1 " in refrig'r. " "
7 " Horizontal "

NEUCHATEL.

7 days Horizontal.
1 " " in oven.
7 " "
14 " Vertical. Pendant up.
2 " " " on left.
2 " " " on right.
2 " Horizontal. Face down.
7 " " Face up.

The mean of daily variation should not exceed 1 second at Geneva, and one-half second at Neuchatel.

The mean rate of going obtained by averaging the seven periods of seven days each recorded at Geneva should be within +3 seconds.

At Neuchatel the variation from lying flat to hanging up should be within three seconds ; the variation from hanging to the two other positions should not exceed five seconds, and the variation between the two variegated positions should be under two seconds.

Thus an average variation of three and a half seconds is allowed at Neuchatel against three seconds at Geneva, while the former observatory requires that the watch should return to within 1·5 after the oven test, and that the averages of the first and last week should agree to three seconds.

SECOND CLASS CHRONOMETER WATCHES.—GENEVA.

14 days in vertical position.
14 " in horizontal
24 hours " in oven.
24 hours " in refrigerator.

NEUCHATEL.

7 days in horizontal position.
24 hours " " " in oven.
7 days " " "
15 " " vertical "

The daily variation, position being unchanged, should not exceed ±1¼ seconds at Geneva, and 1 second at Neuchatel.

The variation from lying to hanging should not exceed six seconds at Geneva, and three seconds at Neuchatel.

The error for compensation should not exceed two-thirds of a second at Geneva and one-fifth of a second at Neuchatel. Moreover, at the latter observatory, the extremes of going must be within two seconds.

THIRD CLASS CHRONOMETER WATCHES.

At Geneva 8 days in horizontal, and 8 days in vertical position.

At Neuchatel fifteen days in horizontal position.

The only condition imposed is at Geneva, where the variation from lying to hanging must not exceed ten seconds, nor the daily variation one and a half seconds, the position remaining unchanged.

The Neuchatel report should show—

1. The main rate of going during test.
2. The daily variation.
3. The difference between extremes of daily variation.

For marine chronometers, and first and second class watches—

4. The variation for 1° Cent.

For marine chronometers and first class watches—

5. The difference between mean of first and last week.

For first and second class watches—

6. The variation from lying to hanging—

For first class watches—

7. Variations between the two hanging positions.
8. Variation between the two lying positions.

At Geneva—

1. Mean temperature from day to day.
2. Average of going in the seven positions.
3. Error of compensation for 1° Cent.

Obituary.

WE have the sorrow to record the death of Mr. Paul A. Brez, for nearly half a century a leading watch importer of this city, and a gentleman honored and respected throughout the trade.

The deceased was of Huguenot descent, born at Latour, in the Waldenses of Northern Italy, and was a citizen of Geneva. He emigrated to this country in the year 1831, at the age of 25, and soon after became a member of the house of John Magnin & Co., the predecessors of the well known house of Magnin, Gueden & Co. In 1841 he established himself on his own account as an importer of watches, and so continued up to the time of his death, which occurred on the 1st of May, 1878, the very day on which he had made arrangements to retire from active business. The deceased was a fine old gentleman of the old school of honorable and successful merchants, courteous, kind, of unflinching integrity, and the very soul of honor. A few weeks ago he followed to the grave the wife of his youth, to whom he was devotedly attached, and there can be little doubt but that this heavy affliction hastened his own death. He leaves the legacy of his honored name and reputation to a son and daughter, in whose bereavement all friends deeply sympathize.

The deceased departed this life at the good old age of three score and ten years, and has been buried by the side of his wife in Greenwood. Of him above most men it may be written, he sleeps the sleep of the just.

GUISEPPE TAGLIABUE, inventor of hydrometers, lactometers and barometers, died on the 7th inst., at Mount Vernon, Westchester County, in the sixty-sixth year of his age. Signor Tagliabue was born in 1812, near Como, Italy, and when very young went to London and served a long apprenticeship with his brother Giovanni, a noted maker of scientific instruments. Forty-four years ago he came to this city, locating himself in Pearl street. He became one of the foremost instrument makers in this country. His hydrometer was adopted by the Revenue Department for the proving of whiskey in preference to all others. Signor Tagliabue was liberal in his views, and was noted among Italian citizens for his charitable deeds.

The Influence of Oriental and Particularly of Japanese Art on the Present Modes of Ornamentation.

IT is one of the peculiarities of the human mind never to be exactly contented with what it has, and novelty is accepted rapturously by all classes of society. On the merit of the new fashion alone is based the strength with which it will grasp the public mind. It may only be a transient fancy, or it may become a substantial addition to the customs or manners of different nations. When as far back as Louis XV. of France, a Chinese embassy found its way to Paris, we find Watteau & Boucher introducing Chinese figures and ornaments into the *Panneaux and trumeaux*, with which they decorated the walls of the charming *petites maisons* and *somptueux* hotels of that period, but the mannerism of the peculiar style of decorative work of that period would not allow designers to adopt freely the suggestions of Oriental art. It is much the same to-day, for a designer in Europe must be dogmatic and only produce things that are archæologically correct, or else he will pass for an ignorant fellow not knowing the rules of the art he professes to work in.

It was only after the French and English expedition to China and Japan, in 1858–9, that oriental articles became sufficiently well-known all over Europe to attract the attention of artists and artisans to the exquisite *naiveté* of their modes of production, and the fashion of admiring and collecting China and Japan work took a serious hold on the public taste. Apart from the merit of the novelty of the articles, and the manner in which they are decorated, Oriental productions bear a character of truthfulness which alone makes them charming.

The Chinese work is generally of a more massive and important character than that of Japanese, and has not been so frequently adapted to the wants of our manufacturers. Europe has used it more than America—where Japanese ornamentation has made the most successful headway. As we mentioned before, European designers are bigoted, and if they introduce Japanese details on the surface, the form of the articles thus decorated will recall the shapes of the fourteenth or sixteenth century—the Oriental crysanthenum or the plum blossom of Japan, will flower and bud on a Queen Anne pitcher or on a Louis Quinze casket. Here in America we have no ancient history of Art, and our designers, like the busy bee, can select the aroma of any art flower they choose to ornament their work. It seems as if New York, placed about half way between Europe and Japan, had the mission of showing the world how Japanese art can be made available for decoration in general.

One important point in Japanese ornamentation is the careful though subtle reproduction of nature. A celebrated painter in Paris used to tell his pupils that to know how to draw was of little use, to know how to paint was not of the greatest importance, but that what was required to be an artist was to *know how to see*. There lies the whole secret, and the Japanese seem to "know how to see" better than any other school of decorators ; their climate is such that they live nearly all the year round out-of-doors, or behind screens, in houses that ignore all rules of architecture and suggest only an improvement on tents ; and they seem to become so familiar with the beautiful nature that surrounds them that no effort is required to paint flowers or trees on their vases. The imagination creates those splendid dragons which seem to play through the skies, the earth and the water, and give an entirely distinct character to Oriental ornamentation. The Japanese, until the last quarter of a century, seemed to be persuaded that the world consisted only of the small islands they inhabited, and their immediate neighborhood, and did not care to go out of their country or allow foreign intruders to come and disturb them. As a natural consequence their arts and manufacturers were entirely original, the only trace of outside influence being the principles of Persian and Chinese art from which they evoluted originally ; and they made it a practice of following their handicrafts from generation to generation, thinking that if the father was a good workman the son would naturally inherit a part of his father's talent, and if he continued in the family profession he could add something to the hereditary amount of knowledge he should transmit to his son.

Thus some families only painted one particular species of insect, and another one plant. The family of Gorobasso—generally called Gorosso, have been workers in hammered bronze for nine generations, and the present family, which consists of a man, a woman, and their daughter, produce exquisite work. Another reason which led to the high standard of perfection they have attained is that the feudal princes encouraged art manufacture among their retainers to the highest degree. For instance, the Prince of Satzuma directed a manufacture of a peculiar kind of earthenware, found only in the province of which he was master, and the name of which has always been associated with the most valuable of Japanese fictile fabrics. Others directed their attention to weaving, others to metal work, and in this way hundreds of magnificent pieces were produced, not for the market, but for presents or for keeping ; and here we must note a curious peculiarity of the Japanese character. They hoard up their treasures as a miser would his gold, and some of their finest dresses, lacquers, bronzes or plates sometimes do not see the light of day for many years.

This explains the apparent freshness and perfect state of preservation of some pieces and makes us incredulous when those who want to dispose of them say that they are very old. The care with which the Japanese dealer handles his precious wares would make the aver age Yankee salesman smile, for he wraps them up in silk or in a bag made on purpose, which is carefully bound with a silk cord, and then he places it in a box that it fits exactly, which box is also secured by a cord tied in one of the inimitable Japanese knots.

Japanese productions can be divided into two principal classes, the *Newa-Yaki*, literally the "wares made in the yard," and the commercial goods made since the overthrow of the feudal system.

To the first class belong the exquisite productions made under the special superintendence of the Damios, who rivalled with each other in the production of the finest specimens. The number of pieces made in this way is of course limited, but there is no knowing how many may be stored away, and come to light as the demand increases, and the prices advance. The peculiar feature of this class of production is that there is in nearly all instances as much work as possible to the square inch. In the decoration of some pieces of Satzuma we have seen two patterns in different shades underlaying each other, while a third one was made in camel (such as the French call *a la goutelette*), and enveloped the whole piece in a fret work in relief as fine as lace. On some of the bronzes of a corresponding period the delicacy of the chasing can only be appreciated through a magnifying glass.

In the modern work, as money is the object and no longer fame, more rapid methods of manufacture are employed, and effects are attained in a less tedious manner, though often it is as pleasing, if not more so, than in the very elaborate ornamentation of the older pieces.

We had unfortunately inherited from the collectors of Europe an idea which comes from the limited sense of appreciation, that is, that a piece to be fine must be old. We have found out now that such is not the case. Of course in his selfishness a collector prepares an old piece because there is less chance of there being a duplicate of it, but our observations are not about collectors, but about the use we can make of the Japanese methods of working.

In the first place, then, ornamentation is scarcely ever symmetrical, even in color, but it is always exceedingly well balanced, and that alone is a feature which overthrows all the old system of decoration. In the second place they have no prejudices in the mixture of colors, and following the lessons taught by nature they unite colors in a manner never before thought of. They know how to stain metals in the most fantastical colors, and one of the great reasons of the strong grip their methods have taken upon our taste is that they are so novel that they take us entirely by surprise without startling us. Their method in art is true, though to us it is new. We fail in criticising it because we have no criterino of their art to refer to ; and decora tive art, which for three hundred years has lived for forms on the evolutions of the Borghese Vase, and a few kindred types of shape

accepts with pleasure vases, the shape of which is derived from the gourde and other fruits or natural objects. Scholastic art has tortured the human form and boxed it up in coffin-shaped "gaines," cutting off the arms and placing heavy weights on its head. The only explanation given for these amputations was the high sounding name of *cariathides*. They have put horns, tails, and wings to them spliced them on the bodies of horses and fishes, with the pompous names of *centaurs* and *syrens*. Clapped wings on the backs of inoffensive babes, and dubbed them cherubs or cupids according to the characters they were to perform in clerical or worldly acts. Not so the Japanese—they have enough respect for God's most noble work not to put tails to it nor wings; they leave that for the dragons, and even in their textile fabrics and embroideries show an independence and freshness that pleases even the most critical admirer of conventional design.

Influence of Air-Pressure on Clocks.

Extract from a paper read before the Society of National Sciences at Neuchatel, by Dr. Hipp.)

IT has been demonstrated that the timekeeping of a clock is influenced by the degree of density of the air in which it moves; but the variation thus caused is so slight as to require a first-class regulator to discover it; and the most curious fact is, that while one clock retards under a stronger air-pressure, another advances under the same influence. The means adopted for compensating this barometrical influence are more or less successful in practice.

Several astronomers maintained the opinion that the degree of density did not directly affect the speed of the pendulum, but only the extent of its arc of oscillation, and it follows, therefore, that the variation in the clock is not due to an alteration in density of air, but to some secondary cause—viz., the change in the arc of oscillation. This would explain the fact that one clock advances while another retards; for we know—thanks to the ingenious experiments of Winner and Longier—that the suspension spring, according to its length and thickness, may be combined with the weight of the bob so as to produce isochronism, and we add that the escapement will produce similar results. Admitting that the air-pressure affects the arc of oscillation, and that this influence explains the variation in the timekeeping of a clock, would it be safe to conclude that the density of air produces no other effects; or may we not rather suppose that this force alters the amplitude, and acts also in the speed directly; and thus explain the observed facts by combining both influences? We have tried to clear up this question by experiments.

We know that a pendulum or balance makes a larger oscillation in rarefied than in dense air, and, therefore, by observing the movements of a clock in rarefied and afterwards in compressed air, we should be able to value the effect produced. The execution of such an experiment presents, however, so many difficulties that we were obliged to abandon it and adopt an easier method. Experience has led us to believe that the resistances offered by air and water to bodies moving in these elements are governed by the same laws. Thus, by setting a clock in motion, first in water and then in air, we have two extreme cases; the density of water being about 773 times greater than that of air. This would then enable us to observe with the greatest facility what influence the respective media have on the movements of a pendulum. The difficulty of plunging the whole pendulum in water may be obviated by letting only some portion of it move in the liquid, just sufficient to produce the desired effect on the extent of the arc of oscillation. After this principle we arranged the pendulum of the regulator which controls the electric clocks of this town Neuchatel. This pendulum terminates with a steel point, destined to indicate on a scale the degree of the arcs described, and it is this point which should move in water. The receptacle containing the water was so disposed as to be easily raised or lowered, to cause the steel point to sink according to the requirements of the experiment. As the experiment was, however, to extend over some weeks, and the water would in consequence of evaporation diminish its height, we replaced it by glycerine, which underwent no alteration during the whole period of observation, and must confess that the results were quite different from what we anticipated.

For the benefit of those who are not acquainted with the organization of the electric clocks at Neuchatel, we must state that an electric signal, coming from the observatory at one o'clock daily, unhooks a coincidence clock, which enables one to ascertain any error in the regulator to a sixtieth of a second. This error is daily corrected by means of auxiliary clocks, one of which causes the regulator to advance, the other to retard. The total amplitude of the arc described by the pendulum in air was $2^{\circ}\ 54^{m}$, which was reduced to $2^{\circ}\ 6^{m}$ when the point was immersed in the glycerine for about $3'4^{mm}$. On plunging the point deeper into the glycerine the pendulum stopped. From the 11th to the 18th January, a period of eight days, the mean time of the regulator, with the pendulum point dragging in the glycerine, indicated a loss of 0^{s}, 4 in 24 hours; and a second observation, from the 19th to the 26th, also eight days, made without the glycerine and the amplitude restored to its original value ($2^{\circ}\ 54^{m}$), resulted in a retard of 0^{s}, 24. We were astonished to find that the timekeeping of a pendulum was so slightly influenced by its point moving in such an oily substance as glycerine.

What may be concluded from this experience? In our opinion it demonstrates that a difference of air-pressure, such as the variations of the barometer admit, and which are far from producing an effect on the amplitude of the pendulum comparable to the one we have just mentioned, has not a sufficiently important influence on the timekeeping of a clock to warrant a correction of this fault by barometrical means, an operation which has often been tried. If we admit, what is not yet definitely proved, that a more or less dense medium affects a pendulum by a change of its arc of oscillation only, any arrangement for this correction would be useless; because, by altering the length and thickness of the suspension spring far more serious defects may be rectified than those arising from barometrical height. We do not pretend that our experiment, and the deductions which may be drawn from it, suffice to settle this important question; but hope they will at least further its solution, and encourage other researches.

Some time after this paper was read, Dr. Hipp communicated the results of further experiments on the same subject, and to the same society. He says:

In my previous communication, I stated that the question relating to the influence of the density of a medium on the movements of a pendulum may be examined by letting the point of it move in water, but many have expressed their doubts on the comparison of the action of a pendulum in air and in water contained in a vessel. To give a satisfactory answer to this objection, I made some additional experiments; and although I admit that the means employed may still leave something to be desired as regards exactitude, I believe that the results which can be deduced from my research approach as near the truth as possible, always supposing that the difference in the densities of media is considerable. I made use of a half-seconds pendulum, steel verge, with a diameter of $4^{mm},5$, with a disc of 30^{mm} thickness, and 110^{mm} diameter; the weight of the pendulum was kils. 1,550. It would, of course, be out of question to entertain the movement of such a pendulum in water by means of any escapement, which would be sure to affect its action. It was imperative to measure the duration of a single, or a short series of oscillations to evade any sensible alteration in the amplitude. The spring suspension could not be employed either, on account of the influence which the spring would exercise in different amplitudes and media; and I was obliged to adopt the suspension *a couteau*, which does not interfere with the oscillations of the pendulum. A small contact mechanism interrupted and re-established a current at the end of one or

several oscillations, and was so disposed as to leave the oscillations free for the whole duration. The pendulum oscillated in a water reservoir which could be filled or emptied at will, thus enabling the former to move in air and water alternately. The vibrations were measured by means of a chronoscope, which, as is well known, indicates the interval between the opening and closing of a current. I always made a series of measurements, which, between themselves did not differ more than two to three thousandths of a second. It is true, this difference of a few thousandths of a second per oscillation would amount to three or four minutes in the course of twenty-four hours; but as the variation obtained, according to the medium, is about 100 thousandths, it will be seen that the result is exact by about 1'30. After many attempts to perfect my arrangements and method of observation, I found as the mean for seventy observations for a double oscillation *in the air:*

With an amplitude of 16° $1^s,01833$
" " 4° $1^s,01742$

Or for twenty-four hours:

With 16° amplitude a retard of $26^m\ 24^s$
" 4° " " $25^m\ 5^s$

The pendulum could, of course, have been more strictly regulated if it had been of any importance. We find, therefore, that the loss increases with the arcs, a result which I anticipated. The oscillations in water gave:

By 16° amplitude for the duration of an oscillation $1^s,08565$, or a daily retard of 2h. 3m. 20s., and by 4° $1^s,0859$ per oscillation, or a retard of 2h. 3m. 42s. The action of the pendulum in water, compared with its movement in air, shows, therefore, by 16° amplitude an additional daily loss of 1h. 36m. 56s., or 1h. 38m. 37s. for an arc of 4°. Let us consider the latter result of my experiment, which indicates a loss of 5917^s per day for the pendulum oscillating in water in comparison to its movement in air. From this we can deduce the variation resulting from a difference of 1^{mm} in the air-pressure; in fact, the mean pressure in Neuchatel is about 720^{mm}, and if we take the figure 773 as the relative density of air and water, we have evidently

$$773 : 5917^s = \tfrac{1}{720} : X.$$

that is, the pendulum varies daily by $0^s,0106$ per milimeter of barometrical pressure. This value of a hundredth of a second, as the effect of a barometrical variation of 1^{mm} on the movement of a pendulum, perfectly coincides with the results of experiments made elsewhere. We have, therefore, in my observations a proof of the reality of this barometrical variation in clocks which cannot be sufficiently explained by the modification a denser medium imposes upon the amplitude of oscillation; and I maintain that the fact of an advance in some clocks, followed by a loss in others under corresponding pressure, is due to secondary causes arising from the suspension spring, escapement, etc.

I am inclined to think that this barometrical variation can be compensated by some method similar to those applied for thermometrical compensation. It will, however, be nccessary that the means adopted are delicate enough not to alter the movement of the pendulum by secondary influences beyond the few hundredths of a second which are to be corrected. The objection might be made that the results I obtained with a half-seconds pendulum are, perhaps, not applicable to a seconds pendulum, and, to satisfy myself on that point, I repeated my experiments with a pendulum of that description. The arrangements were the same, the bob also; only it was applied to a rod of about a meter, to cause the pendulum to beat the second as near as possible. About a third of its length was immersed in water; and although it would have been still more accurate if the whole of it had been plunged in, the difference is certainly without influence on the result. Without recapitulating the particulars of the mode of measurement, I give the indications of the chronoscope for the duration of ten oscillations:

In air with an amplitude of 8° the mean duration was $9^s,4799$
" " 4° " " $9^s,4780$
" " 2° " " $9^s,4762$

In water with an amplitude of 8° the mean duration was $10^s,0882$
" " 4° " " $10^s,0792$
" " 2° " " $10^s,0885$

To be as brief as possible, I limit myself again to the result obtained for an amplitude of 4°, and we see that the pendulum loses in water $0^s,09012$ per oscillation, or 5194^s=1h. 26m. 34s. per 24 hours; while for the half-seconds pendulum we had a loss of 1h. 38m. 37s. for the same period. An application of the previous computation demonstrates that an augmentation of 1^{mm} in atmospheric pressure is equivalent to a loss of $0^s,0093$ in the diurnal motions of a seconds pendulum. The loss in a half-seconds pendulum was $0^s,0106$, so that the retard is equal for both by about one-tenth of its value. At present I do not wish to discuss whether this difference is real, or only due to imperfect observations, and I beg to state again that I did not intend to obtain measures of the utmost precision. I believe, however, that I have experimentally shown that a pendulum oscillating free under the influence of its own weight only, without wheelwork or escapement, loses in a denser medium, and that this loss is about $0^s,01$ per 24 hours for an increase in the air density corresponding to a barometrical variation of 1^{mm}; and I repeat that the hypothesis of a similitude of the laws governing the movements of bodies in air and in water has received further confirmation.—*Translated from the Journal Suisse d'Horlogerie.*

The Manufacture of Jewelry.

BY GEORGE WALLIS.

THE business of the lapidary is to cut the rough gems into such forms as will best preserve their weight and enchance their brilliancy when set; and great experience, skill, and ingenuity is necessary to effect this properly. The work is long and tedious, and in the case of diamonds of large size, very costly; but still it pays for all the trouble, labor, and expense, when a pure gem is properly cut, so as to bring out its peculiarities and beauty; for this is the purpose and end of the operation.

The old English method of cutting, or rather the forms in which the stones appeared when cut, is known as the single cut, or star single cut. The present fashion results in brilliants, and double cut. A table forms the upper surface of a brilliant, while the girdle of the stone is its broadest part and is generally about a third of the depth. The bezil is that part which is above the girdle, and the base of the stone is the collet, which should be two-thirds below the girdle. The width of the stone across the girdle and the depth from table so collet, when cut, should be equal; and a little consideration shows that these agree with the generic form of the gem, an octahedron, and thus as little as possible of the material has been cut away to render it perfect as a brilliant. Roses are cut in triangular facets over the contour of the stone. The brillolette is in the form of two rose diamonds placed back to back, and is used chiefly for pendants; both sides of the jewel being required to be seen.

Pearls, which are taken from marine and fresh-water shells, are composed of carbonate of lime and organic matter. They are largely used, and have always been highly esteemed from the iridescent character of their surface. Whether employed alone or in combination with stones, thus producing contrast of color and effect, pearls are almost invariably welcome additions in the setting of a jewel. When used, as they frequently are, in large quantities, they produce in the hands of the skilful jeweler effects which other materials fail to rival.

Cameos in shell and stone are also largely used, the latter being much more costly and desirable than the former, although the shell cameos frequently permit of great variation in the detail of the subject treated, which may be executed with much refinement and high artistic finish. Small Roman masaics, composed of very minute tesseræ of colored stones, real or artificial, were formerly used to a great extent for setting in gold, but they have ceased to be much in demand.

Artificial gems or pastes are now manufactured chiefly in France, from a vitreous substance known generically as "Strass," from its inventor, a German. This so-called "Mayence base" is prepared from pure rock crystal or flint powder and salt of tartar, which, after due mixing and baking, is treated with nitric acid until it ceases to effervesce, the grit being washed until the water comes off tasteless. Fine white lead is subsequently added, and then calcined borax as a flux. To the third stage of preparation nitre is added, and, on the mixture being melted for the last time, a crystal of a beautiful lustre is the result. Wiéland gives a base for "Strass," which is composed of silex, potash, borax, oxide of lead, and sometimes arsenic. The coloring is obtained from metallic oxides For instance, the sapphire is imitated by using oxide of cobalt, the oriental ruby by precipitate of Cassius, oxide of iron prepared with nitric acid, golden sulphuret of antimony, and manganese calcined with nitre, with rock crystal added to the "Strass." The emerald is imitated by using carbonate of copper, glass of antimony, and oxide of cobalt, and the yellow diamond by chloride of silver and glass of antimony. Rubies are also imita ed by using manganese.

These are quoted simply as illustrations of the method by which the color of various stones is produced with the greatest success. As a primary consideration, everything depends upon the purity and excellence of the vitreous base or "Strass," which itself, when treated by the lapidary's wheel in its uncolored state, counterfeits rose diamonds and brilliants with great success.

The production of imitation stones was carried on with considerable success at Birmingham about fifty or sixty years ago, but under very great difficulties, by reason of the Excise laws on the glass trade. The most beautiful qualities and tints of topaz, ruby, emerald, and diamond "paste" were produced there. They are now imported more cheaply than they can be made.

Jewelry, at least in its modern treatment, may be divided into three generic sections :

1st.—That in which the stones or gems are the leading features, constituting in their arrangement the design, and completing, by the effect obtained in the setting, the purpose of the jewel. The metal, gold or otherwise, is used simply as the mechanical means of fixing and arranging the gems ; being practically unseen except as a means of holding the object together as a decoration for the person.

2nd.—That in which the gems and gold, in combination with enamel, or engraving, or both, go to make up the design by an artistic distribution of the materials in the construction of the jewel as a whole.

3rd.—That in which gold or metal alone is used, and in which the whole design is wrought and embellished by engraving and chasing, or worked perfectly plain so far as surface is concerned, the display of the metal itself being the leading feature of the design.

The modes of production have been already named as partaking of two distinct features, hand-work and machinery. But a third has to be recognized, an this is the combination of hand-work and mechanically produced details.

The hand-work method is the most ancient, the most legitimate, the most artistic, and, as a matter of course, the most costly ; yet there are few art-industries in which the skilled worker can be said to require fewer appliances for the prosecution of his handicraft.

In Oriental countries to this day, the traveling jeweler is not unlike the traveling tinker of our own country. He carries with him all the means of executing the ornaments that he may be commissioned to make. The gold for the purposes of this work is given to him by his employer, and he squats down in some convenient position, within or outside the residence of his patron, and hammers, cuts, drills, shapes out and puts together after a somewhat rude fashion, but with an unerring instinct, ornaments which, in point of fitness to the purposes for which they are intended, and harmony of effect as regards the combination of form and color, the Western imitator fails to approach, in spite of all the mechanical skill and scientific appliances made ready to the hand.

The Oriental worker takes the minimum of gold and other materials, and out of these he gets the maximum of effect, without any special efforts to do more than give each portion of metal, each stone, and each touch of enamel, its proper position and value. He never commits the vulgarism of making a great display of gold surface, for the purpose of suggesting a bullion value which does not exist. Whatever the materials may be, rich and rare, simple or common, he makes the best of them in their integrity, from gold and gems of the purest quality and most perfect character to the primitive imitations in glass and paste, or bits of metal foil or wood. Thus each material stands for exactly what it is, neither more nor less.

The tools and appliances necessary for a working jeweler to start in business on his own account are comparatively few, and a few pounds enables him to secure every requisite for carrying on the production of jewelery by hand. A peculiarly shaped work bench, a jet of gas, or the flame of a candle or lamp, some solder, and the inevitable blowpipe, with a vice, hammer, shears, files, punches, and drills, may be said to pretty nearly represent the plant. A few old coins, or for want of them some new ones, a few ounces of silver and zinc, and your working jeweler can commence his business, if he has skill, ingenuity, and a fair share of artistic taste. These simple elements have been the beginning of many highly successful men and important establishments.

This will account for the extent to which the working jewelers of Birmingham have spread themselves, erecting their own little workshops near to their dwelling houses, and carry on business after a very independent and certainly respectable fashion. In Clerkenwell the same thing occurs, but in a different way, because under less favorable local circumstances and social aspects.

As a matter of course the successful workers and their decendants have become capitalists, establishing manufactories in which, although the same division of labor exists, in relation to the special articles of jewelry to which individual workmen direct their attention, yet the whole is under a general supervision and direction. Admirably arranged and well lighted and ventilated workshops, however, now take the place of the little workshops in the back-yard or in the attic.

The introduction of machinery for a variety of purposes has caused a great change not only in the extent of the productions, especially at Birmingham, but in the artistic characteristics of modern manufactured jewelry.

Hand-made work of a heavy and costly character, which is now chiefly carried on in London, mostly in Clerkenwell, for the great houses at the West End which supply jewelry to the public, requires of necessity a large amount of experience, ingenuity, and skill to execute in a satisfactory manner. A design is generally made on paper, a drawing in fact representing the appearance of the article required, with sections, etc., showing the construction in cases where any novelty in that direction is aimed at. The working jeweler, taking into consideration the exigencies of his materials, proceeds to cut and shape the thin plates of gold, which in most cases is ready rolled to a suitable thickness for this purpose. He hammers, files, and punches the various portions into the requisite forms, adapting them for soldering tegether, or fastening by pins and rivets as may be required. In the cases where elaborate ornamental details, the human figure, or representations of animal life are required, he beats up the plate of metal to the general contour of the ornament or figure. During this operation of beating up the gold to a given shape, the metal has to be frequently passed through the fire for the purpose of annealing, otherwise it would split or crack from becoming brittle under the hammering. Filling the inside with a mixture of pitch and brickdust, he proceeds to punch and chase the details upon the surface to be finished, in the same manner as the silversmith or goldsmith works his ornaments by the repoussé process upon the surface of a vessel formed of either of the precious metels. When complete, the pitchy substance is melted out, and the detail is ready to be soldered, or otherwise fixed in its intended position.

Proceedings of the Horological Club.

A Distinguished Body of Watch and Clock Makers.

Fiftieth Discussion.—Communicated by the Secretary.

NOTICE TO CORRESPONDENTS.

Correspondents often write that they would like replies in the next number of the Circular, when their letters are not received by the Secretary till from two days to two weeks after the meeting of the Club. We wish to again notify our readers that all communications they desire to lay before us must be received *not later* than two days before the end of each calendar month, in order to be discussed and reported in the Circular for the succeeding month. State your points fully and clearly, but as briefly as possible, write only on one side of the paper, address the letters to Secretary of Hololog ical Club, and mail them to D. H. Hopkinson, Esq., endorsed "For the Club." Such letters can of course be sent with letters on other business, but matters for the Club should not be mixed in with business matters and in the same letter. Attention to these points will save trouble and delay. Letters should also be sent in as early as possib e. especially if they contain questions which must be handed to some member for examination before the meeting of the Club.

Secretary of the Horological Club:

Will you be kind enough to inform me of the best method for accurately measuring the *length* (exact) of balance staffs, balance pivots, train pinions, etc. ?—the work to be done on the foot lathe. 2nd, What preparation can I use to remove the discoloration from gold after soldering? For instance, the black corrode, I pickle off, which leaves a greenish white film, very difficult to cut loose, excepting with an emery brush, and if there are any fine sharp edges to the engraving the job looks botchy. Is there not some method of dipping to restore the *original color* of the gold, leaving nothing but to polish? Many jobs will not pay for the trouble according to my method, and I'm anxious to learn something better. Naturally, I look to those who are supposed to know. Will not some of the members post me in this matter? P. W. S.

If you would cover your work with McLane's anti-oxidizer, replied Mr. Rolliver it would not have any pickle coat on it. But if there is a pickle coat on, cover with anti-oxidizer, make red-hot and boil in pickle. Do this three or four times and it will restore to its natural color or nearly so. Mr. Uhrmacher replied to the first inquiry, that the best ordinary test for such measurements is the patent or pump dividers. The points should be very fine, the slide should work closely, and the pump center or point should be at a right angle with the slide, so that moving it in or further out would not change the distance between imaginary parallel lines drawn through the two points. In measuring, the slide should be parallel with the center line of the piece of work, from end to end, and the pump center is pushed out far enough to reach the more distant of the places to be measured. Then, if the direct length of the part is wanted, the pump center is drawn back till it projects out the same distance as the other point, when the distance between the two points is compared with a scale. If anything better was wanted, it would not be very difficult to make a small tool with parallel slides, moved by a fine screw with graduated head. The pitch of the screw being known, each thread would count a certain amount, and the fraction of a turn given to the head would be that proportion of that amount. If any of our readers have worked out such a tool and found it to be practically valuable, we should be pleased to receive a description of it.

THE NEW COMPENSATION PENDULUM FOR REGULATORS.

Mr. Regulator reported that he had examined the drawings and description sent by J. H. B., last month, and thought the idea a good one. There was one weak point about it, and that was the mode of supporting it. If the pendulum rests on a round stud, as shown in the drawings, it will either get out of balance at each vibration, by the change of the point of support; or it will slip on the stud, especially if jarred, and be permanently out of balance. It would be better to support it on a knife-edge, but even that is subject to more or less wear and friction. Perhaps Mr. B. could contrive some way of using a suspension spring, and yet retain the acting top of the rods at the level of the point of suspension. This could be done by having the under edge of the supporting stud level with the upper surface of the top cross bar, and a suspension spring on each side of the bar, reaching down the proper length for a good action. A spring steel, V shaped piece, fastened to the top bar, would reach down to the lower end, of the spring and connect by the usual pin. The springs and this rider being both of the same metal and of the same length, would not perceptibly differ in length under changes of temperature, and the pendulum would have a constant support. There should also be some more convenient way to regulate for time. He would recommend Mr. B. to make these improvements, then draw the whole on a small scale, with full description, and send them in for discussion before the Club.

THOSE READY-MADE PIVOT DRILLS—STRAIGHTENING BENT PIVOTS—OUTSIDE COMPETITION.

Secretary of Horological Club:

Please inform me where I can get the pivot drills spoken of in February number of the Club. Also ask the Club the best way to straighten bent pivots, without drawing the temper, I have something to say about outside competit on. I rent a store in a small place and pay $140 a year rent, and devote it entirely to jewelry, etc. Another store (dry goods) keeps a stock of jewelry, silver-plated ware, etc., and by getting more people in their store and soliciting, they manage to cut prices so it is almost impossible to get along. How can we stop the wholesale houses selling to them. L. E. S.

Mr. McFuzee was pleased to be able to state that D. H. Hopkinson, Esq., had received a lot of these drills for sale at the office of the Circular, for only $4 per set. This he thought was remarkably cheap for 126 drills, in 21 different sizes, with two drill-stocks, and all enclosed in a neat box. He had fully described these excellent and useful articles at the February meeting of the Club, but would now add a caution to the workman, that for common drilling the temper should be reduced a little. As sold, they are hard enough for any work, and therefore more liable to break by rough handling on common jobs, for which a lower temper would do just as well. As there were six drills of each size, it would be easy to have one or two of each temper required.

There is no way of straight ning pivots safely, except by first drawing the temper low enough to bend back, without danger of breaking off. The proper amount would be different in different kinds of steel, and the more the pivot had been bent the lower the temper must be got to make it safe to straighten them up. The best way of operating was given in Excelsior's Practical Hints, section 295, in the Circular for August, 1876.

As to keeping the wholesale houses from selling to outside parties, that was impossible. But every dealer should refuse to patronize houses guilty of that practice. There were plenty of firms who did an honorable, legitimate business, exclusively with the trade, and such firms should be the ones to receive the favors of dealers. He also thought that jewelers should not keep the cheap trash at all, but leave all that trade to the dry goods and mock auction houses, telling customers who would say that they could buy cheaper at such a place, that if they wanted brass jewelry and Peter Funk watches, the cheap and nasty stores would be just the places to find that class of goods.

BOOK WANTED—MEASURING TENTHS OF SECONDS.

Secretary of Horological Club:

I wish to ask if you could give any information of a small book on repairing watches, with photographs of the different escapements, published by W. H. Binghampton, New York. I think those are his initials, but I forget the name. I had such a book but lost it, and I would like to get one. Also can you inform me how the tenths of a second are measured by a regulator. J. S.

Mr. Ruby Pin said he had heard of the book mentioned, but he believed that it was out of print at that time, some ten years ago. If he was in error, some reader could correct him. The time could not be measured to the tenth of a second on any ordinary regulator. There must be some apparatus for dividing up the seconds, of which the usual chronograph was an example.

REMOVING JEWELS FROM THEIR SETTINGS.

Secretary of Horological Club:

Please inform me if jewels in watch plates or bridges can be removed without breaking the same or injury to the bezzle? *If so, how?* Also, how stones in a close setting are removed, and with what kind of an instrument it is done? E. P.

Mr. Lapidary replied that the only safe way was to run a very thin, sharp-edged tool, similar to a pen-knife blade with a straight edge, around the jewel or stone to raise the setting. After getting it up all around, a stouter tool could be used to complete the work, but very carefully, as much pressure upon the jewel would be certain to scale the jewel or even crack it.

PAPER DUST RINGS FOR SWISS WATCHES.

Secretary Horological Club:

Any watch maker doing business in a locality where dust, dirt and sand prevail to the extent they do here, will find the "paper dust ring" for Swiss watches, worthy of their attention. Provided they are troubled as I used to be, by "*stops*" caused by little pieces of sand, etc. I cut and keep on hand, as part of my material, strips of thin writing paper from ⅛ to ¼ inch wide, by 3 to 5 inches long to put around on the inside of cases, thoroughly covering the two case springs and the spaces opposite, so that if any "foreign matter" gets into the case where the lift or catch spring project, it is retained between the edge of the case and the "paper dust ring." A little practice only is wanted to teach one where to cut the strip a little narrower or wider, to suit the inside edge of the case to be fitted. Care being taken, where the balance goes, to press it back sufficiently to clear the banking pin, (in cylinders) and screw heads, (in levers.) No copyright or patent on it, all have my consent to use it.

P. M. WHITMAN.

Mr. O'Lever said he could not see why that was not a good idea, and keep out a good deal of dirt. If neatly done, it ought not to look badly, but rather to the contrary. Such little wrinkles are what we want, ideas which have occurred to workmen, as meeting some of the special wants of the trade, of which there are so many.

GOLD PLATING WITHOUT A BATTERY—SANDIVER.

Secretary of Horological Club:

What is Sandiver? I have seen it spoken of in the CIRCULAR. How can I can I make a gilding solution that will give a good Roman gold color, by placing the article on a strip of zinc and placing both in the solution without a battery? B. C. B.

Mr. Electrode advised B. C. B. not to undertake gold plating without a battery. There was no certainty of controlling the color of the deposit, and it was also wasteful of the gold. This objection was not so important in silver plating,but when a battery could be bought or made so cheaply, it would be poor economy to do gold plating without one. Sandiver is the scum taken from the surface of molten glass in the factories, after mixing and fusing the different ingredients.

WATCHMAKER'S TROUBLES.

Secretary Horological Club:

I think that something ought to be said in favor of a much abused class of workmen, those who may say that they never know when their work is finished, and often get blamed without good reasons for the same, although they may be very skillful and honest about their work or dealings. I mean the watch sellers and repairers. For this purpose I shall commence a series of articles about the annoyances to which we, pivot and watch dealers are frequently subjected. All that I shall state is what I have learned from a very long experience in the business, and will vouch for the truth of all I say, and which all persons selling or repairing watches will acknowledge that they are more or less subjected to.

A person calls on you and wishes to procure a cheap watch, say about twenty or twenty-five dollars, for which you can supply him with a very fair timekeeper in silver cases; but you tell him that he had better pay a little more, and that he will get one much more reliable and that will give him better satisfaction. He cannot or will not pay more than the above price, and sometimes less. After wearing it for perhaps nearly a year without finding any fault with it, he may perhaps overwind it, or the spring may be broken—a common occurrence in a cheap American movement, where there is no stop works, or some dirt may have got in the wheels, pinions or escapement, and stopped it. He comes and tells you that you have deceived him, that Mr. So and So has a watch that has not been out of order for years. They do not tell you that the other watch cost possibly twice as much as their own, and that the person using it is more careful in winding or wearing it than they are. Some will go so far as to tell you that a watch should not get out of order at all, as there are places where they can buy them and have them warranted for three years. To such I can only say, does not machinery of any kind get out of order? such as a locomotive, printing press, piano, etc., in fact any pieces of machinery which are kept in motion, only part of the time, while a watch is kept in continual action every day and night, and being continually shifted in its positions. As for any one warranting a watch for three years, they are not practical workmen, and care but little for their reputation, all they want is their money.

Often, after selling a ladies' watch, the husband or father will bring it back and say this watch does not keep good time. I will ask does it stop, gain or lose time? The answer is generally, I don't know myself, you had better keep it for a few days and try it. After examining it and seeing nothing the matter with it, I return it and tell the husband, father, or brother to do me the favor to take it under their special charge for a few days, and see that it is wound up regularly every day, at as nearly the same hour as possible. With such I have invariably found that there was no more trouble, for ladies in general are not very particular about winding their watches unless they wish to use them when going out, etc. This is the first part of what we have to bear, to be followed in the next by others from

EXPERIENCE.

Mr. Isochronal said he could corroborate the statements of "Experience," as he had himself been through every one of the trials mentioned. He hoped Mr. E. would continue his interesting series, as it would be not only amusing, but would furnish many good hints to beginners in trade, by showing them how an old hand talks to customers and gets around the various obstacles we all have to meet. As a matter of course, some manage these things better than others, and we like to know the best ways for circumventing the dead beats and mean customers.

MR. VOIGHT'S NEW CHRONOMETER ESCAPEMENT.

Mr. Uhrmacher then exhibited an improvement in the chronometer escapement made by F. H. Voight, of Buffalo, N. Y. The sample was an ordinary Broadway movement of the Waltham Co., with the escapement altered over. The unlocking angle was about 20°, and the impulse angle about 40°. The unlocking was performed remarkably easily, and during the short time he had tried it it performed very well indeed. The members were highly pleased with the simplicity and apparent effectiveness of the invention, which is entirely different from the chronometer escapement Mr. V. laid before the Club a year or more ago. Mr. Horologer said that as he had been informed that it was to be described by Excelsior in his Practical Hints for this month, he would only add that he considered it an excellent invention, and advised Mr. V. to go on with it.

FITTING BALANCE STAFFS.—LENGTHENING THE GUARD POINT OF LEVER FORKS.—WORN CLOCK VERGES.—FINISHING PINION LEAVES.—BREAKING JEWELS.

Secretary of the Horological Club:

Some time ago a correspondent inquired about the details of putting in balance staffs. Another reader of the CIRCULAR was kind enough to respond but gave only an outline of the cement method. I sent to Mr. Hopkinson a detailed account, which he did not publish. I think my article would have filled the bill, but I may be a little vain about the matter. If Excelsior is approaching that part of his subject, we had better wait and see what he says.

Another way of putting forward the guard pin of American or similar levers, is to put a piece of brass wire in the lathe with a split chuck, and turn down a portion of the end to a little larger than the old pin, and then form a pivot on the end that will fit in the hole in the end of the lever, and which is to be riveted on the lower side of the lever, leaving the large part for the guard pin. This may be filed back if necessary. This plan is good when the guard pin is loose and weak from any cause.

When the verge of a clock is worn in deeply, a new surface may be obtained by driving the escape wheel, hub and all further on the staff About the thickness of the escape wheel is sufficient generally. I found these two "tricks" out myself, and think it would be for the benefit of the trade if watchmakers would send in such little items for publication.

How can I remove the bur left on the end of pinion leaves after turning them? I find it a tedious job. I got my diamond dust

graded all right, but when I broach out jewel holes they very often split. I either ruin the broach or the jewel in the lathe. Can this be helped? Yours, F. W. H.

Mr. Horologer said that the method of fitting a staff mentioned by F. W. H. had not been received, and we should be pleased to have him repeat it. What was called for was, as stated at the January meeting, a detailed description, from an expert in staff fitting, of the whole process, from the steel in the rough to the fully finished staff staked ready for the movement. He had thought it a little strange that no one had sent in such an account, for there must be many of our readers fully capable of giving not only good methods, but those in some respects superior to the standard practice. Every old workman had found out many short cuts and handy "wrinkles" by experience, and an account of them could not fail to be interesting and instructive to others. Let us hear from all who have learned any of these "tricks," and we shall soon have a valuable collection of instructions. Removing the bur on the corners of the pinion leaves could be done with a stiff brush, or, in hard cases, with a piece of peg-wood, after grinding the ends of the leaves for polishing. This operation will weaken the bur, by thinning it at the corners, so that it will easily come off. The breaking of the jewels is caused by running the broach too far in the holes. It should never be put in far enough to be *tight* or fit all around, but should always be free in the hole.

GOLD HAIR SPRINGS FOR WATCHES.

Secretary Horological Club:

I have had a dispute with a man who says that gold hair-springs are far superior to steel, and wondered why manufacturers did not make them. We give his reasons why they were better. I claimed that gold hair-springs could not possibly be practicable. Who is right? C. S. R.

Mr. Isochronal replied that gold springs have been used, and strongly advocated by some of the most eminent chronometer makers. But even their great skill could not make them equal to steel. Gold is free from two great faults of steel, liability to rust and to become magnetized, but is not equal to it in elasticity, either temporary or permanent, which is the prime requisite in a balance spring. It also has other faults. The merits and demerits of gold hair-springs are discussed by Excelsior, who is our best authority, in his book—"A Practical Treatise on the Balance Spring, and the Compensation Balance," page 16, and he sums them up as follows: "But long experience has shown that it is not as reliable as steel, besides that it is more difficult to work properly, and its expansibility in heat being greater than that of steel, it requires heavier adjusting screws in the balance, thus introducing a train of evils which more than offset all its advantages over steel." For use in places where the atmosphere was always moist, and some other special circumstances, gold would be preferable, but in all other cases steel is better.

CUTTING ON PRICES, ORDINARY WORKMEN, BOTCHES, ETC.

Secretary of Horological Club:

I became especially interested in that part of the proceedings of your March meeting connected with Mr. H. P. Beardsley's communication upon the points indicated by the above caption. I am habitually sympathetic in disposition, and hope you will pardon any apparent presumption in response to Mr. Clerkenwell's despairing appeal at the close of his remarks; even if my bold effort to "fly to the rescue," should prove practically futile.

When I first opened business (almost without capital), I realized sensitively the situation Mr. B. has introduced for discussion, and which Mr C. has brought out in his masterly manner. That situation (of your correspondent) has long since been changed. There are four watchmaker shops in our little city and some very ordinary workmen, notwithstanding we sustain good prices for good work, untrammeled by price cutting. The method employed to accomplish that end was, first, to get good tools and display them in a handsome case convenient of access. Second, to do good work practically and finish it, giving special attention to cleaning and polishing watch cases (every one) and repaired jewelry, so that when the work was given to the customer it had a new appearance. This is done rapidly on a polishing lathe, with such appliances as may be seen in any watch case and jewelry factory. Third, to secure a city, fee bill, headed list of prices for watch price list work and jewelry jobbing. This fee bill we placed in a handsome frame, and hung it so as to be the observed of all observers. It indicated steep prices, mine averaged a third lower. Meantime I maintained that the work was nothing inferior to the work of the best city shops, and when it was handed out it carried with it that unmistakable appearance. The charges often elicited the remark, "It is pretty steep, but it's a nice job. Then the fee bill was immediately consulted, showing the respective prices for such work altogether higher. If the charges were to be agreed upon in advance, the work was examined to show what must be done, using the fee bill terms to explain the needed repairs, and the prices. Then offer to do it at the usual rates and in the best style. It takes well. Since adopting this method we have not realized a dearth of customers, but it cultivates a taste for artistic work, brings in the kind of work a good workman enjoys, and drives the bull's eyes, brass watches, and gilt jewelry repairs to the cheap ordinary workmen and botches, where it belongs. But if the owners of brass watches, etc., are attracted by the name of the best workmen, they can generally be persuaded to get their cases plated, and a good appearance brought out for a good price. Now for the climax: let ever country city and subscriber to the CIRCULAR send in requests to the Horological Club for a price list of work in the trade, neatly got up under the auspices of that honorable body, representing New York charges. I can think of nothing that would so tend to establish uniform prices and protect good workmen, as such a price list used as above indicated. AMALTHEIA.

Mr. Clerkenwell replied that the first and second points mentioned were good. The second, especially, was too much neglected by workmen generally. Customers were unable to judge as to the quality of the work done for them, but they could judge of its appearance. If it looked bright, fresh, and well polished, they received a good impression of the job, which disposed them to be pleased with its performance. On the contrary, if it looked dull aud dirty, they were dissatisfied at the start, and no matter how well the work was really done they were not prepared to be pleased with it. Even if perfect, they could not tell whether it was so or not. But what they could tell—the appearance they knew was nothing to boast of, so they judge the whole by that, and doubt even the best performance. He would impress this point strongly upon the attention of workmen, and while insisting on work being well done, would also urge them to be particular about the *appearance* of the job.

As to his third point, however, he thought that city watchmakers would not care to be made scapegoats of, for the benefit of their country brethren. Besides that, there was no such thing as a uniform scale of prices in this city. Stores on the same street and same block would differ greatly, and some houses on Broadway would charge double the rates of equally good shops around the corner, or on a side street. Prices were governed by the style of the store and the class of customers it had. The hour being late, the Club then adjourned, not having been able to quite finish the business awaiting attention.

IRISH BELLEEKWARE.—Belleek-ware is a new and very pretty ware for ornamental purposes, which has the exquisite delicacy and finish of mother-of-pearl. Its glaze is so brilliant that it is iredescent, while its lustre is that of fine glass. It is not transparent, but it has the effect of transparency from the delicacy of its tints and the perfect polish of its glaze. As the works at Belleek supply considerable quantities of goods of various kinds for the trade of which your journal is the first and special organ, I should take it as a great favor if you would permit me to correct the phrase, "It is not transparent," by a short statement of facts that I trust will be as clear as the ware in question is itself translucent.

The composition of Belleek china is as pure a porcelain as the Japanese or any other real china, and widely different from the factitious bone-china body of the English make, fifty per cent. of the same being calcined bone; hence its tendency to "fly" with hot water—a result due to the phosphate of lime not being able to withstand the sudden alteration of heat and cold. The Belleek china, on the other hand, is a pure felspathic china, containing nothing but Irish felspar and china-clay, consequently eminently transparent. Large deposits of the spar are obtainable from the town-lands adjoining the Belleek Works. The fracture of the Belleek china is quite vitreous, whilst that of the factitious or bone-body china resembles loaf-sugar; and from the well-known inability of phosphoric acid to flux, or act on the silica in clay and stone used in the body, the atoms of silica remain like a plum-pudding stone instead of being one homogeneous mass, such as the Belleek china is. In fact, from the quantity of bone in the English china, nearly every specimen of it can be dissolved by boiling it in nitric acid, whilst no acid, the fluoric alone excepted, has any action on the Belleek china. R. A.

Repairing Musical Boxes.

By L. A. Grosclaude.—No. 2.

In a preceding number of the Jewelers' Circular was given, in a brief way, an idea of the manner in which a musical box is made, and indications when a box should be repaired at the manufacturer's or elsewhere. We will now admit that the cylinder is in sufficiently good condition, and will mention, one after another, the accidents which may be easily repaired by any skilled workman, possessing ordinary tools.

Next to the cylinder, one of the most important parts of the musical box, is the key-board. We will first see how all accidents happening to a key-board can be remedied.

It is well-known that the number of vibrations of a pendulum in a given time, is regulated by the weight ot the pendulum-ball. The heavier it is, the more slowly will it vibrate, and the lighter it is, the more quickly will it go. The same is to be found with the key of a key-board, which is nothing but the half of a tuning fork.

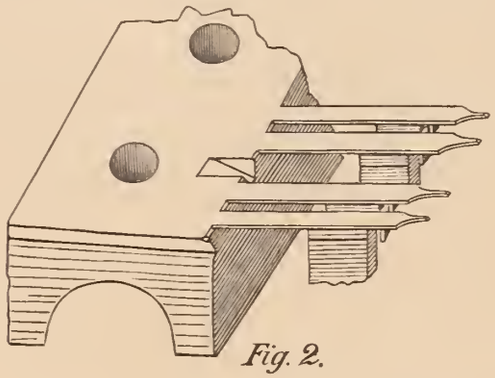


Fig. 2.

The lower tones giving a less number of vibrations in a second than the higher ones, it will suffice to load the end of the key to lower the tone, and to lighten it to have a higher tone. It will also be easily understood that a thick key or a short one will vibrate more quickly than a thin or long one. After these suggestions, it will be very easy for any one to put any number of keys to the right tone.

Any person having had a key-board in hand, will have noticed that there are two kinds of keys; some having lead at the end and others that have none. For those having lead, it will be sufficient to cut some of it to elevate the tone, and to file the key between the



Fig. 3.

lead and the brass plot, to lower it. For those without lead, the same must be done to lower the tone, but having no lead, must be filed near the end underneath to elevate it. As you must avoid having any thin keys (these not possessing good sound) instead of filing a key to lower it, it will be often preferable to change the lead for a heavier one or supply the deficiency by solder.

We have now to see in what manner a missing tooth may be replaced. Take a piece of steel and make a key of the same shape as the missing one, or the adjacent ones, but on the under part a heel must be devised as indicated in *Fig.* 3. In the steel block of the

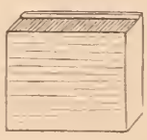


Fig. 4.

key-board, with a file of the width of the key, make a notch as indicated by *Fig.* 2. Hammer the new key in it its place, so that the heel will exactly fill the hollow space, and so that the key will be placed as much as possiible in the right direction and right level. In making the new key, the point must be made a little longer and a little wider than the adjacent ones. Then temper the new key, draw t to a dark blue, so that it will vibrate like a good spring and at the same time so that it can be filed. Whiten the heel of the key, put it in place and solder it. This must be done with a soldering copper, (*sor a souder*) which weighs at least 6 or 8 pounds, so as to retain sufficient heat. Lay the copper pretty hot on the heel of the key when in its place and after a few moments delay, the solder will run. The solder and acid are the same as used by tin-men. (*soudere d' étain et eau a souder, c' est a dire du zinc dissous dans de l' acide muriatique ou esprit de sel*) The key, well fixed, must then be finished, filed on the top to a level with the other keys, and tuned by filing it underneath. It is necessary here to say in what way the under part of a key can be easily filed. Put in the vice a small block of steel or brass, a little thicker than the key is wide, about ¾in. long, with a small elevation lengthwise. Place the key to be filed on this block, the whole comb being held in the hand underside up, and with a certain pressure the key will rise above the others, and will be easily filed with a square file 3-16 inch wide and 6 inch long. When the key to be filed is in the middle of a long key-board, it will be advantageous to make an appropriate handle to the file, as indicated by *Fig.* 5.



Fig. 5.

The point of the key must then be finished, that is, filed to its proper width, (to correspond to the other points) and at the same time, brought as nearly as possible to the same distance from the two adjacent points. For putting the point to its exact length, it would be well to hold the key-board with the keys perpendicularly on a piece of flat window-glass, and by reflection, it will be easily seen when it is brought to the same length as the others.

Place the point of the key, when it is filed to the right width, as nearly as possible to its right level, and proper distance from the adjacent ones. Sometimes it may be found necessary, however, to change the place of the point of a key; to lower it so as to put it on a level with the other ones, or to shift it to the right or left. In this case, a small anvil must be made, well tempered, of about the same shape as the one used for filing the keys, but quite flat on top, with no elevation. The hammer used must have one end tempered, with the end a little rounded and not too sharp. If a key is forged on

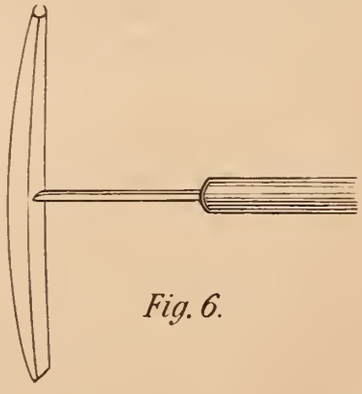


Fig. 6.

the left angle, it will move to the right and vice versa. The key must be forged on the underside. Here a certain practice is quite necessary; the key must be well placed on the anvil, the place to be reforged resting well on it, and two or three strokes of the hammer will make the key move a little.

To lower or elevate a key, another anvil of the same size as the preceding one is necessary, tempered, but notched on the top. (Fig. 7) The key is laid lengthwise and quite flat on this anvil, and by strik-

ing the key with the other end of the hammer, (Fig. 6) which is flat and not tempered, the key will bend upwards. In both of these cases, much care must be taken, as it is very easy to break a key in using this hammer.

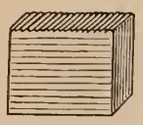


Fig. 7.

In case only a point of a key is broken it is not necessary to replace the whole key. With the blow-pipe (chalumeare) the end of the key must be untempered, but care must be taken that the flexible part of the key be not beaten and untempered (the sound would be lost) a small notch is made with a narrow file (*lime a entrer*) and a small piece of spring filed and pressed in. It will be easily soldered with a small soldering copper. Then the point must be finished, as already indicated.

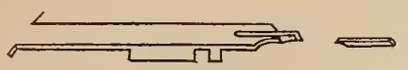


Fig. 8.

It may be well to remark here, that when a key is untempered and has no sound, it will sometimes regain some sound by drawing it to a blue with the blow-pipe, without previously tempering it.

Now the whole key-board being complete, no keys or points missing, it must be put on the musical box-plate, (platine) and the line of small dots, which every cylinder carries, will serve to indicate if all the points of the key-board occupy their right places. This can also be seen by the pegs ; when the cylinder turns, the pegs must all come exactly under the middle of each point of the key-board. When it is ascertained that all the points are in their places, the key-board must be finished completely, that is, all missing spirals replaced, and the key-board then definitely tuned.

The tuning must always be done twice, because all operations upon a key change its tone a little, even when a spiral is changed ; and before hammering a key, it must be brought to the proper thickness, and about to its right tone. It may be advisable here to remark that in the first tuning it is well to leave the key half a tone too high, because by putting a spiral at its end lowers the tone and in general it is easier to lower the tone than to elevate it.

There remains now only to be seen what form must be given to the spirals, how to put the key-board in its right place, and in general, how to have a good playing musical box. This we will examine in the following and last article.

Artificial Rubies.

OF all precious stones the true Oriental ruby is by far the most valuable. A stone of only moderate size will fetch ten times the value of a diamond of equal weight ; and as for a ruby of unusual magnitude, its price is entirely dependent on the caprice of the market. In the year 1875 two of the finest rubies ever seen in Europe were brought over from Burmah, in consequence, it was rumored, of the poverty of the Burmese Government. One of the stones weighed 47 1-16 carats, and the other 37 carats, but they were recut in that country, and thereby necessarily lost a small fraction of their weight before they were resold. After having been cut they found purchasers on the Continent, and Mr. Streeter believes that the smaller of the two stones realized as much as £10,000. And yet the ruby is nothing more than a transparent red variety of corundum, a mineral which in its impurest forms is known to every one as emery. Chemically it consists solely of alumina, the oxide of that light silvery metal, aluminum, which, in the form of a silicate, enters so largely into the composition of all ordinary clays. The value of the ruby lies, of course, in the peculiar beauty of its color, in its extreme hardness, and in its excessive rarity. It is interesting to learn that so valuable a gem has been successfully imitated on a large scale. And by an "imitation" we do not mean a mere counterfeit of the stone in paste, but an artificial substance agreeing both in chemical and in physical characters with the natural gem. By forming a fusible aluminate, such as an aluminate of lead, and than heating this compound with siliceous matter, the chemist obtains a fused mass, from which, on cooling, free alumina separates in crystalline forms. The crystals are, to all intents and purposes, white corundum. If a red color be required, like that of the ruby, the skillful operator obtains it by addition of a small proportion ot bichromate of potassium to the mixture of alumina and red-lead from which the aluminate of lead is prepared. Let the deep blue of the sapphire be demanded—and it must be remembered that sapphire differs from ruby only in point of color—and the demand is at once met by addition of a small quantity of oxide of cobalt with a trace of bichromate of potassium. Indeed, the chemist appears to have the color of his artificial corundums perfectly under control. In some of the recent experiments 20 or 30 kilograms of material have been operated on ; and prolonged calcination in a glass-furnace has yielded a crystalline mass weighing several kilograms. Some of these colored alumina seems to be fine enough for the purposes of the jeweler, and in fact is said to differ in no wise from the natural ruby. The ruby is so hard as to scratch topaz ; the artificial product is equally hard, and, indeed, some lapidaries have declared that in respect of hardness it excels the true gem. The ruby has a specific gravity of about 4 ; and this exactly the density of the artificial substance. The ruby crystallizes in the hexagonal system ; and so, too, does this chemically prepared alumina. The natural ruby loses color when heated, and regains it when cooled ; the artificial ruby behaves in like manner when similarly treated. In short, the description which has been communicated to the French Academy shows that little or no difference can be detected between the gem and its imitation. As the artificial substance may be obtained in considerable quantity, the authors seem justified in suggesting that it is likely to be used by the watchmaker in jeweling watches, and by the jeweler in ornamental purposes. The latter application, however, must depend on the character of the color; and the chemist must be singularly fortunate if he can imitate with perfection those peculiar tints which connoisseurs so highly prize in the best rubies. In the course of these experiments M M. Fremy and Feil obtained, in association with the artificial ruby, certain crystalline silicates which closely resemble such minerals as cyanite. Although it is of great interest to obtain chemical products which may thus be compared with natural substances, it by no means follows that in doing this we have actually laid bare the secrets by which ruby and these crystalline silicates have been formed in nature. It often happens, indeed, that the same point may be reached by several distinction ; and it is only the incautious generalizer who would conclude that the experiments in the chemist's crucible are necessarily identical with those by which similar products have been brought forth in the bowels of the earth. Nature is ever fertile in resource ; and, above all else, it must be remembered that in her operations she commands an amount of time which is practically unlimited, and which obviously places the imitative attempts of man at a disadvantage that is simply immeasurable.

MR. A. E. OUTERBRIDGE, JR., of the Philadelphia Assay Office, exhibited before the Franklin Institute some thin films of gold obtained by electric deposition upon copper and afterward detached. Mr. Outerbridge has thus produced films of gold so thin that one grain of the metal would cover nearly four square feet. This is 10,000 times thinner than ordinary paper, and 2,708,000 of such films would only make one inch in thickness.

Precious Stones and Gems.

BY EDWIN W. STREETER.

IN addition to the prominent diamond-bearing localities described before, we might readily point to several other spots in the Colony where the gem has occasionally been found. Thus the Borah Tin and Diamond Mining Company obtained upwards of 200 diamonds in the course of a few months, from their mine near the junction of Cope's Creek with the Gwydir. Most of the stones were either of light straw color or of very pale green tint. The largest weighed 5 grains. The Bengover Tin Mine, about two miles below the Borah workings, has yielded several diamonds, including one of 7½ grains. A stone of 9 grains has been found at Bald Hill, Tambaroora, Hill End; and it would be easy, were it necessary, to multiply our notices of the diamond-yielding localities of New South Wales.

Compared with the diamond discoveries of this Colony, those of other parts of Australia sink into insignificance. South Australia is rich in minerals treasure; but this treasure mostly takes the form of ores of copper and iron. Yet the Colony is not without its gold fields, and with the gold a few diamonds have been found. In the year 1852 diamonds were discovered in alluvial gold washings in the hills, near Echuca, about twenty miles south-east of Adelaide. It is said that more than a hundred diamonds have at different times been found in this neighborhood.

Whilst Victoria is pre eminently the "Golden Colony," and its gold-fields have for many years been actively explored, it is only now and then that a solitary diamond has been discovered. In 1862 the discovery of a diamond in the Ovens district was announced by Mr. George Foord. It was a transparent yellow crystal, with perfect edges, weighing about 2 grains. The Rev. J. J. Bleasdale, who has paid great attention to the study of Australian gems, described three Victorian Diamonds—two from Beechworth, and the third from Collingwood Flat. There appears, however, to have been for several years, some little doubt hanging over the reputed discoveries of diamonds in Victoria; but in 1865 an exhibition of gems was held in the hall of the Royal Society of Victoria, and, from the specimens then exhibited, and the information accompanying them, the matter was set at rest. "The results of this exhibition," said Dr. Bleasdale, "have now placed this important truth beyond impeachment." Altogether about sixty diamonds have been found in the Beechworth district, but they have not been of good color, nor of large size, most of them weighing less than a carat each.

The first Australian diamond ever brought to England was presented by Sir Thomas Mitchell to the Museum of Practical Geology, in Jermyn street, where it may now be seen. This small crystal weighs ¾ of a carat, and was found near Ophir, west of Bathurst, New South Wales.

To sum up our knowledge of Australian diamonds, New South Wales, which is rich in coal, in oil shales, and in various carbonaceous products, is by no means poor in diamonds, although those already discovered are, for the most part, extremely small; South Australia, with its vast wealth in copper and iron, possesses a limited diamond-producing area; Victoria, the great center of the gold-fields, has furnished only an occasional diamond as a mineralogical rarity; and the other Australian colonies, so far as we know, have not hitherto yielded a single diamond. But I dare to prophecy, and that I may prophecy, I will begin by regretting that if, instead of searching for diamonds in the gravel drifts and old river beds, geological researches had been instituted in the gorges of the Australian Alps, in those of the rocky rivers and snowy mountains, it is very likely the matrix would have been discovered, whence the diamonds already found have been washed. The geological formation of the whole of the New England district in New South Wales resembles closely that of the district of the Baggage Mines in Brazil, and sooner or later will be found to yield diamonds in paying quantities. Another diamond field will be found ere long in Queensland, either on the Palmer River or its affluents,—where very remarkable and rich gold mines have lately been discovered—or, on the Gilbert River and its affluents, and in the country extending from the Gilbert to the Gulf of Carpentaria.

BRAZILIAN DIAMONDS.

In Brazil it was first discovered that Itacolumite was the matrix of the diamond. This was suspected by Dr. Gardner, who observed that the matrix of the stone is not the diluvial, gravelly soil, but the metamorphic quartzo-schist rock.

The Grammagoa mountain, on the left bank of the Corrego dos Rois (43 miles north of Diamantina), consists of thick and slightly inclined arenaceous schists, passing at times into Itacolumite. To this mountain above 2,000 people flocked in the beginning of the year 1839 to search for diamonds. For many years the result was successful, but only with much labor. The matrix or mother-stone had to be blasted, and the fragments broken by the hammer, and washed in the Batea. This method, however, had to be abandoned, as the deeper they went, the harder the stone; and the extraction of the diamond out of deep strata, at so much labor, was not so profitable as washing the gravel-beds for them.

In the museum at Rio de Janeiro is a large rounded diamond which retains the impressions of sand-grains.

It is said that the diamonds obtained from the Itacolumite sandstone have rounded angles and corners, whilst those from the sandy schist are perfect crystals. If this be a fact, we must believe that the agency which changed the sandstone into Itacolumite acted also on the diamond.

These diamonds occur not only embedded in the primary strata (living rock) but are also found in the gravels composed of the débris of the decomposing rock. The most important district of these secondary deposits lies between 16° and 26° south latitude, including the Provinces of Minas and St. Paulo, the conditions of which are almost identical with the gold bearing alluvium of Borneo and the Urals.

In the north of Minas is diamantiferous sandstone, covered with a limestone, which again is overlain by a gypsum formation. No sooner are the valleys cut deep enough to expose the sandstone, than everywhere diamonds are found in the river beds of this region, as on the Rio Acary, and other places.

From the defiles of Itambé, the loftiest mountain of this district, the Copivary and Jequitinhonha, rich in diamonds, take their rise. In the first of these, a diamond was found a few years ago of about 9 carats weight. There occur in this district, in constant companionship with the diamond, rounded fragments of clear transparent quartz, also fragments of a very hard, thick, red ironstone, or of black Lydian stone, from the size of a hazel nut to that of a pigeon's egg. The natives give to this last the name of "Feijao," from its likeness to the common black bean, and always hail its presence in the gravel with pleasure, as with it are found other precious stones than the diamond, such as White and Blue Topaz, Spinel, Garnet and Lazulite. Some wonderfully beatiful specimens of Chrysoberyl are also found in the diamond sands of Brazil, of yellow, parsley-green, and sky-blue colors, together with beautiful specimens of rose-colored and sea-green quartz. In the diamond-sand of Bahia is found impure, black, grey, or brown, crystallized carbon, known in commerce as *Carbonado* or *Carbon*.

The sparkling stones found in washing gold were thrown away, or used as card-markers in early times. It was not until 1727 that Bernardio Fonseca Lobo, an inhabitant of Serra do Frio, in the gold district of Minas Geraes, accidentally discovered the true nature of these stones. He had seen rough diamonds in India; and the likeness to these was so striking, that he took a number to Portugal for sale, and thus drew general observation towards the new diamond mines.

The European merchants, who up to this time had obtained their diamonds from India, were frightened lest this discovery should cause

a fall in the price of the gems in their possession. They spread the report that the Brazilian diamonds were only the refuse of the Indian stones, forwarded to Goa, and thence to Brazil.

The Portuguese however, turned the tables, and sent the Brazilian diamonds to Goa and thence to Bengal, where they were offered for sale as Indian stones, and obtained Indian prices. The supply was greatly increased in the early part of this century, by the discovery of new and richer mines in the province of Bahia, the stones of which are called in commerce *Bahais*. They rival in beauty the Indian stone; are roundish, of medium or small size, of a brilliancy and fire not surpassed by those of any other rough diamonds in the world.

The profit made in Minas-Geraes was very considerable. In the first twenty years, 144,000 carats were found annually.

In 1772 the Government first worked the mines on its own account. Rich as the find was, the cost was enormous, for every carat cost the Government from fifteen to eighteen shillings.

Up to 1850 the Province of Minas Geraes has yielded about 5,844,000 carats of diamonds, valued about £9,000,000.

If addition to this, we consider the contraband trade at the beginning of this century, valued at £2,000,000, the worth of the diamonds found in Minas-Geraes would be about £11,000,000. The yield of these mines differs from that of the Bahia mines in shape and color. The form of the stones is more regular, many having the filed crystallization which is noticeable in Cape stones, while their color is more uniform in its greenish tints without any yellow reflection.

Diamonds were found also in other parts of Brazil, especially in the inland provinces. It was soon easy to recognize the sand containing the diamond, by the presence of certain stones called by the natives "Cativos." These are Agates, Tourmalines and Sandstones.

In the dry season of the year, the sand is washed in large basins under water, until the practised eye discovers the diamonds. Formerly, as many as fourteen or fifteen diamonds were often found in a single basin.

The Paraquay and its many tributaries carry down gold and diamonds. During the dry season, from April to the middle of October, when the depth of the river is much diminished, the water is drawn off into a canal, and the mud of the river bed is dug out from six to ten feet, and carried to a place, where it can be washed by the negroes during the wet season. In digging out the mud, large holes are often found containing many diamonds and much gold. When the wet season stops the digging of the "Cascalho," the scene of action is the "washing huts."

Washing troughs (canoes), are placed side by side, and the overseer has a raised seat, so as to be able to observe all the negroes at work

Every trough has its little stream of water, and a negro keeps the contents in constant motion, until the mud has been washed away, and the water is quite clear.

Then the sand and fine gravel are taken in the hand and searched for diamonds. If one is found, the negro stands upright and knocks, as a signal for the overseer, who takes the diamond from him, and lays it in a vessel filled with water, which hangs in the middle of the shed. When the day's work is over the contents of this vessel are taken by the overseer, and their weight entered in a book.

Large diamonds are very rarely found. It has been estimated that in *ten thousand* specimens, rarely more than *one* weighing *twenty* carats is met with, while possibly eight thousand of one carat, or less may be encountered. At the works of the Jequitinhonha River during a year's labor, only two or three stones are found of from seventeen to twenty carats, and in the whole of the works in Brazil, for the space of two years, not more than one of thirty carats was found. In 1851 a diamond weighing 120⅜ carats was discovered at the source of the Patrocinho River in the province of Minas-Geraes.

Somewhat later, on the Rio-das-Belhas, the laborers came upon a stone of 107 carats weight, and in Chapada upon one of 87½ carats.

The largest, however, which has been discovered of late years is that called the "Star of the South," which weighed 254 carats before it was cut. There are many laws and regulations to prevent the negroes concealing and smuggling diamonds. As a means of encouraging honesty, if a negro finds a stone of 17½ carats, he is crowned with a wreath of flowers and led in procession to the manager. Then his freedom is bestowed upon him, plus a suit of clothes and permission to work for wages.

If a negro finds one from eight to ten carats weight, he receives two new shirts, a suit of clothes, hat, and a handsome knife. For smaller, but valuable stones, other rewards are given.

For unfaithfulness, the negroes are beaten with sticks, or have iron bands fastenen round their throats; and for repetition of the fault, they are not admitted to the works again. Notwithstanding all these rewards and punishments, one-third of the produce is supposed to be surreptitiously got rid of by the laborers.

Manifold are the tricks used by the negroes to appropriate and dispose of the stones. In the very presence of the overseer they manage to conceal them in their hair, their mouths, their ears, or between their fingers; they will throw them away, and come to seek them in the dead of night.

The discovery of these precious stones proved in 1746 a great curse to the poor inhabitants of the banks of the Diamond river. Scarcely had the news of the discovery reached the government, ere they tried to secure the riches of these rivers for the Crown. To effect this, the inhabitants were driven away from their homes to wild, far away places, and deprived of their little possessions; nature herself seemed to take part against them: a dreadful drought, succeeded by a violent earthquake, increased their distress. Many of them perished, but those who lived to return on the 18th May, 1805, were benevolently reinstated in their rightful possessions. Strange to say, on their return, the earth seemed strewn with diamonds. After a shower the children used to find gold in the streets, and in the brooks which traversed them. Often the little ones would bring in three or four carats of diamonds. A negro found a diamond at the root of a vegetable in his garden.

Poultry in picking up their food took up diamonds constantly, and their refuse was never thrown away save after careful examination.

The profit of the diamond seeker is a very uncertain quanity. While *one* person may find at one spot in a river 1440 carats, another, like the Spaniard Simon, may seek for four years with the help of 200 slaves and obtain only 7000 carats. In consequence of the large wages demanded by laborers, the number employed has greatly diminished.

When diamonds were first discovered in Bahia, the old capital of Brazil, a densely populated and fruitful province, the observant and intelligent Portuguese minister, Marquis de Pombal, forbade further search, as he feared agriculture, which he justly regarded as the blessing and health of the land, would suffer.

A very strange history is connected with the discovery of diamonds in Bahia. A cunning slave from Minas-Geraes, keeping his master's flocks in Bahia, thought he observed a similarity between the soil of his native place and that of Bahia. He sought therefore in the sand and soon found 700 carats of diamonds. Fleeing from his master, he carried these with him, and offered them for sale in a distant city. Such wealth in the hands of a slave caused him to be arrested, but he would not betray himself. The master to whom he was given up tried to get at his secret by cunning, but without avail, until he thought of restoring to him his former occupation in Bahia, and watching him. As soon as the secret was known, numbers flocked from Minas-Geraes and other parts of Brazil to Bahia, so that the following year as many as 25,000 people were occupied in seeking diamonds there, and the amount daily obtained for some time rose to 1,450 carats.

The number of diamonds seekers gradually diminished to between five and six thousand; but up to the end of the year 1849 there were as many as 932,400 carats of diamonds obtained from the Chapada of Bahia. This rich field is about eighty miles long and forty miles broad. The total produce from the entire Brazil diamond district was, up to the year 1850, over 10,000,000 carats. In the year 1851, the produce increased; but in 1852 it diminished very seriously.

Practical Hints on Watch Repairing.

By Excelsior.—No. 38.

THE SPRING-DETENT OR CHRONOMETER ESCAPEMENT—CONTINUED.

(588) "Setting" is the reverse of overrunning, and is caused by the vibration of the balance being in some way reduced to so small an arc that it fails to unlock. In the majority of cases, however, a careful examination will show that the supposed setting is some variety of tripping, and the fault will be found in an imperfect escapement—a fault of the workman, not of the principle of the escapement. Setting does sometimes occur, but very seldom when the balance has a full vibration. In order to unlock, the balance must move through an arc of 12° in the English, and of 16° in the Swiss style of construction. Now let the workman take the chronometer in his hand, while going as usual, and try if he can, by any kind of motion, reduce the vibrations below that amount, when of course it would be unable to unlock and must stop. The only kind of motion which will much affect the vibration is a rotary or whirling one, in the same plane as that of the balance, or nearly so. The escapement is supposed to be correct, so that stoppage shall not result from other causes—both setting and overrunning being faults which may occur with properly proportioned and adjusted escapements when carried in the pocket, and it should be understood that the remarks upon these faults apply to pocket chronometers only.

(589) If the workman watches the vibrations closely, and succeeds n whirling the watch in a direction opposite to that of the balance and simultaneously with it, through half a turn, he may possibly reduce the vibration to so small an arc that it will fail to unlock. But it will be some time before he does this, if he succeeds at all. If it is so difficult to stop the watch when giving it the kind of motion most likely to do it, *intentionally*, how remote must be the chance of its being done by any accidental motion, which is scarcely ever of that kind, and almost never of sufficient extent to produce stoppage. As already observed, setting is a possible occurrence but very rare, being more often a convenient term used by workmen who cannot remedy or even discover the true difficulty, and cover up their incompetency by discrediting the value of the escapement.

(590) Setting is thought by many to be due to large impulse angle, and they recommend to enlarge the roller and diminish the impulse angle from 45° to 36°, in pocket chronometers, to prevent this fault. They seem to overlook the mechanical rule that if we lengthen one lever we must correspondingly shorten the other; and, with a given motive force, an enlarged impulse roller will receive the pressure of the teeth upon a longer lever, but through a shorter distance, while the smaller roller will receive the pressure upon a shorter lever but through a greater distance, (see Fig. 34,) so that the mechanical effect is the same. And the fact that watches made as proposed do stop from setting, shows that the adoption of a smaller impulse angle does not obviate this fault. In reality, however, as already stated the majority of cases of stopping attributed to setting are due to some form of tripping. No man can say positively that a chronometer has stopped by setting, unless he either knows the escapement to be perfectly adjusted in every respect, so that no other cause could exist, or has actually seen it "set," without tripping, while he was watching it. The fact that a watch is found stopped when pulled from the pocket is no more a proof of its setting than of its stopping in any one of a dozen other ways. In a case of genuine setting, the remedy is to give a larger normal vibration to the balance, either by perfecting the condition and adjustment of the train, and of the escapement, if wrong; or by increasing the motive force,—by keying up the mainspring, or fitting in a stronger one. This latter course will necessitate the subsequent readjustment of the isochronal action of the hair-spring, (133,) if disturbed thereby.

ROLLER AND DETENT ACTION.

(591) This action is at least equal in importance to any in the chronometer escapement, as upon its correctness depends the even tolerable performance or non-performance of the others. It consists of an unlocking roller with its jewel or pallet *n*, Fig. 40, and the unlocking spring, *t*, attached to the detent. In order to clearly show its relations with the other actions, we will draw as much of them as is necessary to make the description intelligible, as already directed. In Fig. 40 we have the English style of escapement, omitting that portion of the detent including its spring and foot, which have been previously given. This figure shows the position of the parts when at rest, with the tooth 5 locked on the pallet. It will be evident that to start

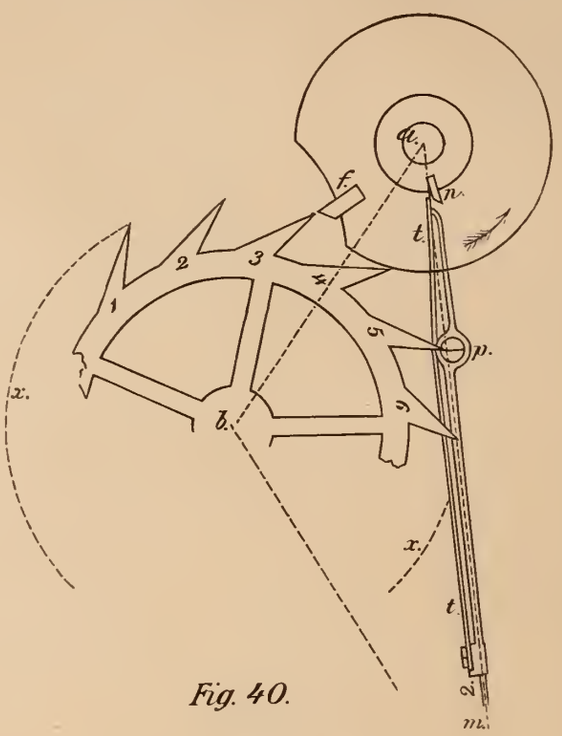


Fig. 40.

the watch, the motion of the balance must first be to the left, to carry the unlocking pallet *n* past the gold spring *t*, to its unlocking side; then to the right, to move the detent pallet *p* back out of the wheel circle, when the tooth 3 can drop upon the impulse pallet *f*, and the watch is running. The roller *n* and the ends of the detent and gold spring are of course below the impulse roller, although shown as if above, in the cut, for the sake of clearness.

(592) As has already been stated, when an impulse has been given, and a tooth is locked on the detent pallet *p*, the balance goes on through half of its vibration, to the right, or in the direction of the arrow. It then returns, and when the unlocking jewel *n* strikes the end of the unlocking spring *t*, the latter, having no support till at its foot, at 2, and being very thin and long, gives way and allows the unlocking jewel to "pass," with but a slight resistance to the motion of the balance. Having finished its excursion to the left, the balance again advances to the right, but now, when the unlocking pallet strikes the gold spring, the latter is supported by the point of the detent, and the distance from there to the end of the spring is so short that, instead of yielding, it forces the detent back till the locking pallet *p* is carried out of the wheel circle and the wheel is free to advance. At this instant the acting face of the impulse pallet should be 5° in front of the tooth 3, (as shown in Fig. 34,) which immediately overtakes the pallet and presses it onward through the whole of the intersection of the wheel and roller circles, or impulse angle, when it is locked again in the position of tooth 4,—the unlocking pallet having previously passed off from the gold spring, and the detent having been carried back to its place by the action of its spring 1 to 2, as described in the wheel and detent action.

(593) Should the unlocking jewel have failed to carry the locking pallet *p* entirely out of the wheel circle, of course the tooth 5 would be unable to escape, the detent would return to its old place against the banking screw without unlocking, and the train would remain

stationary while the balance might continue to vibrate for a short time. This effect may result from three causes; an unlocking roller too small, or a gold spring too short, or not following the detent line at its end. As regards the first, a slight variation in the size of the unlocking roller is of no great importance, provided the length of the unlocking spring is adapted to it. The larger the roller the smaller the unlocking angle, or angle through which the balance must move in order that the unlocking pallet may carry the detent pallet *p* entirely out of the escape wheel circle *xx;* while the smaller the roller the greater the unlocking angle, but the less power is required for unlocking, as the lever is shorter, being nearer to the balance center, and therefore there is a smaller retarding effect upon its vibrations. The circle described by the point of the unlocking pallet is the working size of the roller. The usual size is about half that of the impulse roller. But in the writer's opinion it could safely be considerably larger than that, if the weight of the detent was reduced as much as possible, and the detent spring correspondingly weakened, and would still effect the locking with all necessary ease.

(594) An illustration of this is given by an improvement in the chronometer escapement, made by Mr. F. H. Voigt, of Buffalo, N. Y., and submitted to me for examination, which very much simplifies its construction, and renders it as cheap and easy to adjust as a detached lever escapement. The unlocking roller and pallet are dispensed with, and their duties performed by a small vertical pin in the impulse roller, similar to the ruby pin of a lever escapement, located at the proper angle from the face of the impulse pallet. This pin plays above the detent instead of outside of its end, and acts upon a lip on the upper edge of the gold spring at its end—the spring and the detent being of equal length. The insertion of the unlocking stone in the impulse roller is not new, but Mr. V. makes his pin adjustable in position, by placing it eccentrically in a screw, which can be turned in the roller to bring the pin as desired, in the same way as the banking screws of the American watches. The novelty is, 1st, In the lip on the gold spring and the unlocking pin vibrating over the detent, and, 2d, The detent line does not run to the balance center, but to the pin, or nearly to the edge of the impulse roller. By this disposition, the pin does not have to move the gold sping so far, either to "pass" or to unlock, as if the detent lay in the line of centers *am*, Figs. 35 and 40. The pin strikes the right side of the lip, in "passing," and leaves it by its outside edge; returning, it strikes the left side of the lip, in unlocking, and passes off its inside edge,—both being oblique frictions, on low inclines, and lessening both the angle of contact and the labor of the pin, which is certainly very easy in the sample movement sent me. As Mr. V. will probably publish a description and engraving of his ingenious improvement soon, I would refer the reader to that for further explanation, and recommend a study of its peculiarities and merits, both as an improving mental exercise, and to test the thoroughness of his knowledge of the principles of this escapement.

(595) The gold spring *t* is screwed upon the enlargement of the detent at 2, with its end resting against the projecting ledge as shown in Fig. 40, which prevents it changing its position vertically. From there, with as few bends as possible, it reaches past the pallet ring *p* and the detent point, till it intersects with the unlocking pallet *n*, where it should be bent to the dotted line of the detent, and point directly to the center of the balance staff. No matter how the unlocking spring may be curved during its length, in order to pass projecting parts of the detent, etc., its end must again coincide with the line of the detent, and press slightly against its point. The point of the detent should reach very nearly to the unlocking pallet *n*, so as to support the spring, which should be brought to the detent line before reaching the detent point. The latter should therefore be exactly in the detent line *am*, in order to properly support the spring. This is to be examined after the draw of the locking pallet, and the lap of the tooth upon it have been properly adjusted by the banking screw or pin.

(596) If the detent point is not then in the line *am*, it must be bent to bring it there. If hard, it should be softened till it will be perfectly safe to bend it, as a spring temper is not necessary at the further end. Although very few workmen ever bend the detent, even when it is evidently needed, it very often ought to be done, in completing or correcting the adjustment of the point to support the gold spring, and is much more easily accomplished than twisting the end of the spring to bring it nearly where it should be. That proceeding is scarcely ever satisfactory in its results, and not much better than to leave the spring on one or the other side of the detent line. But the workman should in no case attempt to bring the spring to correct position by altering the banking screw, as that would only remove one fault by producing another equally as bad, and sometimes worse. In case the banking screw is not tight in its place, it may have accidentally worked out a little. If so, it should be made perfectly secure, then the lap of the tooth on the locking pallet carefully adjusted, and the point of the detent brought to line *am*. The edge of the detent point against which the gold spring rests, should be perfectly vertical, so as to support the spring in that position.

(597) The strength of the gold or unlocking spring *t* is generally directed to be such as will offer nearly as much resistance to the balance in "passing" as is felt in unlocking. But such a rule is without any reason. In unlocking, the balance has to overcome the resistance of the detent spring, of the draw of the locking pallet, and of the friction of the tooth upon it, besides suddenly moving the weight of the detent; but, in "passing," any unnecessary resistance is to that extent injurious. All that is needed is that the gold spring shall be stiff enough to perform its duties properly. If too weak, it will yield under the pressure of the unlocking pallet, when passing to the right, (especially if the point of the detent is not very near to the end of the spring,) and the unlocking will be delayed at the beginning, and completed too soon at the end. This weakness will be evinced by a slight wavering near *p*, when *n* strikes it, in moving to the right. Or it may be tried with the balance removed, and the mainspring let down, by pressing against the end of the spring and in the same direction as before, when the detent should be moved back enough to clear the wheel circle *xx*, without perceptible bending of the spring *t*. A weak spring may be stiffened some by burnishing, to give it more temper, or by so bending the point of the detent as to support it nearer to the end, unless that will cause the detent point to touch the unlocking pallet in passing. If neither of these modes will answer, a stiffer spring must be made.

(598) If the gold spring is too stiff, it will unnecessarily check the motion of the balance in "passing." This can be tried with the escape wheel removed, by comparing the resistance of the gold spring with that of the detent spring, by means of the balance and its hair-spring. First find how far from the point of rest the balance must be moved to the right in order to gain sufficient momentum to enable the pallet *n* to "pass" the gold spring. Move it a little further each time, noticing the position of some convenient screw in the rim, until, when let go, the gold spring is passed and drops against the detent point. Next find how far the balance must be moved to the left to enable the pallet *n* to pass off from the spring in the opposite direction when let go. As the pallet *n*, when at rest, stands a few degrees to the right of the spring, as shown, it follows that if the strengths of the gold spring and the detent spring were equal, the balance must be moved a little further to the right in order to clear the spring *t*, than would suffice when moved to the left. If the distances required for clearing are equal on both sides, then the detent spring is stronger than the gold spring, which is as it should be. And if the distance to the right is a little less than that to the left, it is still better. But the workman should at least aim to equalize the two distances. Another, and more common, but not so good, way is to set the balance to vibrating, not far enough to "pass" the gold spring, but just short of that, and see if the resistance of the spring against the pallet *n* at each alternate vibration causes the motion of

the balance to die down rapidly, or has but little effect. These trials should be made with the movement in the horizontal position, in order to prevent the weight of the detent from affecting the test in either direction.

599 When the gold spring is too stiff it can be thinned down by laying it on some broad flat surface, and stoning it off with a "scotch gray" slip,—holding it down by the foot, and *drawing* the stone over it from the foot to the point. The object of laying it on a broad surface is to keep the slip level and prevent stoning one edge thinner than the other, or the edges thinner than the middle. This operation should be confined to springs which either have never been bent or have been curved so gently that the bends can be entirely removed before stoning. If the spring is not made perfectly straight, some parts will be stoned off more than the rest, and these thin places will destroy its equal action. All such springs can be weakened by filing them narrower, instead of grinding them thinner. To do this, the spring should be held between two straight-edged metal strips, screwed in the vise, with the edge projecting above the strips as much as is to be filed off. After filing down to the strips, stone off the edge before removing from the vise, to take off any feather edge that might be left by the filing. The edge operated upon should be the one which is more liable to interfere with parts above or below. The spring should not be altered too much at a time. It is better to replace on the detent and test again, after a slight alteration, as one a little too stiff is preferable to one too weak.

Silver in Art.

Edwin C. Taylor, in the International Review, for March-April.

THE useful arts, by which I mean those industries into which the expression of beauty enters as subordinate and not as an essential element, have advanced further in the last decade of years than in the half century immediately preceding.

In no field of industrial art is the improvement more marked than in the artistic and ornamental use of silver, and the fact that the yield of that metal in our own country alone is likely for many years to be vastly in excess of the natural demand, tends to encourage its more abundant use in the arts where it can be employed. The vast surplus over the necessities for coinage had far better be diverted to the uses of art than made the means for striking a blow at our credit that causes it to totter the world over. Were it so used, no representative of the people could stand up and blandly ask to have his electro-plated rag baby taken to the nation's bosom, and its life sustained at the expense of national vigor. We might then be spared the humiliation of reading advertisements in the journals of European cities, offering the services of bankers in exchanging United States securities for some safer investment, and this because those who should hold the national honor as the dearest thing on earth, are willing to even parley with the unfolded ones, who, like Judas, would betray their master for thirty pieces of silver.

The general characteristic that more than any other impresses me is the absence of glare and the subdued and harmonious tone that has been given to the objects most recently made. I have noticed many effects produced by novel methods of ornamentation that have not yet become generally familiar, and which I shall endeavor to intelligibly describe. Conspicuous among these are silver articles inlaid with niello, somewhat after the manner of champleve enamel, and similar to the beautiful Russian work which excited such admiration at the International Exhibition of our Centennial Year. The art of applying this enamel was for some time regarded as a Russian secret, though the metallic oxides, of which it is composed (and which are fused into a homogenous substance again by the process of heating in a furnace) were well known to our metallurgists, and it has lately been successfully employed by craftsmen of Paris and London.

The last year witnessed the development of this valuable ornamental agent in America, and its use in connection with silver is of the highest advantage, as it can be worked with equal facility in mass or in the most delicate lines. Unlike the vitrified enamels used in Oriental and European cloisonne or champleve enamels, niello will bend with the body into which it is inserted, and is not therefore liable to destruction by fracture, nor is it easily injured by abrasion.

In connection with this highly workable composition, which contrasts so well with the unequalled whiteness of silver, pure metals are also inlaid by an ingenious process, so that it is possible to produce a durable surface, having the beautiful polychromatic effects that, until lately were possible only by the aid of such superficial methods of decoration as electro-gilding and oxidation. Copper, iron and gold are used in this way, and what I have said in regard to the indestructibility of niello, applies with equal aptness to inlaid devices of pure metals, which are not merely superficial, but equal in thickness to one-third that of the body into which they are inserted.

While these developments of metallurgy, because of their novelty, attract great attention at this day, the advance toward excellence in repousse chasing is perhaps more interesting to observe. Repousse, literally "pushed again," is the term applied to that process of chasing in which those parts of the ornament in highest relief on hollow bodies of metal are pushed outward by a tool within, and then repushed or repousse with a more delicate instrument without, to form the finer lines of the design. The first, and to the uninitiated, seemingly the most difficult part of this method of ornamenting, is easily accomplished by means of the snarling-iron, an iron bar crooked to opposite right angles at the ends, and narrowing toward the polished rounded point that is brought in contact with the silver. The larger end is made fast in a vise, the other inserted through the neck or mouth of the object to be adorned; and while a skilled workman holds it in the proper position against the upturned point of the snarling-iron, a lad strikes smartly with a hammer near the secured end. The impression on the metal body is caused by concussion, the metal being stretched to the desired extent. These impressions of the snarling-iron bear no resemblance to the finished design, but simply appear as rude excrescences on the otherwise smooth surface. When all the parts where figures are to appear in relief have been suitably impressed, the vessel is filled with a composition of pitch and other resinous substances sufficiently yielding to admit of indentations being placed upon the outer surface. The object is then placed upon a leather cushion, and the truly artistic work is begun, and not even the painter's pencil is made to express more subtly the artist's idea than the tool of the skillful chaser.

From the days of that erratic Italian who left us, in imperishable bronze, his grand conception of the Gorgon's head dangling from the clenched hand of Perseus; from the days of the restless Benvenuto Cellini until now, no process of presenting designs in metals has been so much esteemed as the repousse, and the reason is manifest, for none is so clearly the work of man's mind and hand. The artist chaser can send into the pliant metal his very thought, and by the cunning of his hand render it palpable forever. The extreme ductility of silver renders it highly susceptible to treatment by the repousse process, and it is possible to produce the most delicately finished and expressive repousse pictures.

The opportunities for the exercise of the highest abilities of our artisans in this delightful field of labor have until recently been extremely limited, but a more general appreciation of excellence in decorative art has done much to call them forth, and the requirements of trade which afford them employment now demand the most conscientious work.

It is gratifying to bear testimony to the fact that we possess workers of unsurpassed skill, and that our people have the taste and the will to encourage them. One conspicuous feature of the artistic metal work of our own country during the last decade of years is that the most elaborate, costly, and meritorious works have been objects of household use and not of exclusive luxury, and in this regard we differ from our English cousins, whose master-pieces at the International Exhibition of 1876 were mural plaques, vases, and

other purely decorative objects, while ours were teasets, fruit-holders, and like useful articles. Now, while this may indicate the utilitarian spirit of our people, I can not think it is to be noticed with regret; for the result of bringing objects of beauty into the familiar intercourse of daily life will not be to degrade them, but rather to elevate the taste of the generation growing up under the influence of such surroundings.

Disregard of ornament as a source of enjoyment is generally an indication of mental weakness or want of culture; and as extremes meet, it is common to observe the lavish use of decorative agents and total disuse of them alike by persons who are timid and vulgar.

In the enrichment of objects of silver, another method, which, by the models I have seen, is proved to be susceptible of rare delicacy of treatment, is styled applique work.

In the execution of the process required for the production of this work, the embellishments are separately wrought in the same manner as a piece of jewelry, and laid upon the surface of the object to be adorned, being held in place by ligatures of fine wire. A careful blast from a blow-pipe is then thrown upon it and perfect fusion secured between the surface and the applied ornament—which thus becomes a part of and homogeneous with the original body. In this manner, Japanese devices of birds, fishes, foliage, and human and other figures, lavish Persian ornamentation of floral and other decorations, are admirably treated. By this process of applying raised ornament, another feature of decoration is introduced which until the current year has never been known outside of the curious work-shops of the jealous Japanese, which no European or American may enter.

This new feature is obtained by means of a material which is applied in the manner I have described in regard to raised ornaments of silver, and for want of a better name I shall call it Japanese alloy. It is composed of metallic substances that are susceptible of receiving and retaining various shades of color, as blue-black, gray, yellow, brown, violet and vermilion, which may be employed separately or together, and mixed with gold. The opportunities for metallic decoration which this wonderful and highly valuable compound afford are vast indeed, and render it easy to present the gorgeous plumage of birds, and all the beautiful hues which the wealth of Nature yields in the durable form of metal objects. I regard the discovery of this secret—which is the result of a long series of patient experiments—as the most important step in artistic metal work which our country has taken, and its development will be watched with interest by all who are interested in industrial art in the United States. The use of this alloy, which is yet in its earliest infancy here, is likely to result in the production of rarer and costlier art objects of silver than modern art has known, and the chryselephantine treasures of archaic times will doubtless be rivalled by the many-colored products of American workshops.

Still another mode of imparting superficial designs to metallic bodies without breaking their outlines, is the well-used one of engraving. Though when employed alone it is a feebler method than repousse chasing, and by no means so decorative as applique work, yet, as an adjunct to the latter, and even in some cases alone, it proves a valuable and effective agent for surface decoration.

A peculiar effect wrought in conjunction with applied ornamentation, engraving, or even chasing, is produced by leaving the entire surface (except where some ornamental device is seen) impressed with the dints of the hammer. This unique finish imparts to the body an appearance not unlike that possessed by Japanese "crackle" pottery, and it certainly owns a quaint barbaric beauty. Other objects are indented with an edged hammer, horizontally, so that the lines appear like waves of water, and a very novel and pleasing effect is given by adding raised figures of fishes and marine plants.

Though mental sculpture presumably stands higher as an art than those methods of ornamentation I have named, yet so far as interior decorative objects of American manufacture evince, it must certainly take a subordinate place to repousse chasing, which indeed offers every facility for delicate expression. To France still belongs the palm for figure modeling, and while we have made some worthy attempts, which are seen in recent examples of bronze as well as silver, yet, in the main, American metal statuettes that are shown in the shops are entirely destitute of merit. Bronze "ornaments" that would shock the artistic sense almost of a Parisian chiffonier, monstrosities labeled Shakespeare and Dante and Columbus, which one might bow down and worship without violating the decalogue (for they are shaped with utter disregard to any form of Nature or law of Art), are still bought by our well-to-do and intelligent provincial citizens, and placed conspicuously in their homes, where they continue to mislead the taste of inexperienced bucolic youth.

Now, a nice appreciation of artistic excellence is by no means necessary to perfect mental health (any more than to physical development), but it is particularly essential to the enjoyment of the higher pleasures of the senses. This appreciation is only to be gained by culture, and it is the duty of those persons who have obtained that culture to demand as nearly perfect work as the utmost effort can produce, and to accept nothing less on any plea whatever.

Cheapness has no place in art, and while the ordinary household articles, the spoons and tea-pots may properly be simple and not costly, so soon as the art element enters, and the attempt is made to produce an object of beauty, something that shall gratify the sense, the hampering hand of economy must not be stretched out to destroy the effort. Only the best is good enough in art, and until those who have knowledge of what constitutes the best insist upon having it, there will be a plenty of "art workers" ready to sacrifice art to trade, and foist their meretricious wares upon the market.

Gone to Europe.

Henry Ginnel sailed in the Scythia May 2d, and is expected to return some time in August.

Mr. Magnin, of the firm of Ve J. Magnin, Guédin & Co., is also ploughing the billows of the vasty deep.

R. N. Peterson, of the firm of Baldwin, Sexton & Peterson (wife and daughter), left in the Germanic on the 11th inst.

Leroy W. Fairchild, the well known gold plate manufacturer, and family left in the Republic for Europe May 2d.

D. W. Granbery, of the firm of Hall, Nicoll & Granbery, has secured his berth in the Algeria, which leaves on the 22d.

H. Galbreth, of Duhme & Co., Cincinnati, occupies a stateroom on board the Pommerania, which left this port on the 9th inst.

Arnold Nicoud, of the firm of Nicoud & Howard, sailed in the St. Laurent, on the 8th inst., in company with E. W. Trask, of Aurora, Ill.

D. H. Wickham, Esq., the well known diamond merchant of this city, and father of our ex-Mayor, is now making his ninety-first trip across the Atlantic.

A. K. Sloan, of the firm of Carter, Howkins & Sloan, sailed in the Germanic on the 11th inst., and is doubtless at this time *casting up* his accounts with old Neptune.

A BRISK and entertaining controversy has been waged in England between Messrs. Robbins & Appleton on the one side, and Mr. R. C. Marsh, of Birmingham, and the English Watch Co. on the other. After a number of letters to the newspapers, Messrs. Robbins & Appleton came to the conclusion that facts would be more conclusive than words in deciding the relative merits of their watches, and they accordingly proposed to submit fifty of their movements to compete with fifty watches each from the stock of Mr. Marsh and the English Watch Co., the latter to be of a grade selling at 25 per cent. more than the Waltham watch. These 150 watches were to be picked at hazard and without preparation, and on the completion of the test the owner of each watch which should rank second to pay penalty, the aggregate of which was to be distributed, among the Birmingham characters. Whereupon Mr. R. C. Marsh respectfully but firmly declined to venture his cash, and the English Watch Co. have not been heard from as yet. The moral of which is, that American watches score two more victories in the field of trade competition. What wonder is it that the English government should be ordering watches from Waltham.

Trade Gossip.

Cracked plates carefully mended are "cracked up" by fashionable auctioneers.

Ve J. Magnin, Guedin & Co., think of having a solid marble front to their new store in Union Square.

Thimbles are the latest novelty in celluloid; they are very pleasant to wear, and are said to outlast those made of steel.

The telephone promises to be an invaluable boon to the Chinese, since they have no alphabet to use in telegraphing.

The show window of Stephen Paine, jewelry store, in Westminster street, Providence, was recently robbed of diamonds valued at about $5,000.

Glass-covered medallions containing Japanese scenes wrought in gold and enameled with high colors, are the latest style of clasps on costly bracelets.

Those possessing valuable jewels are urged by detectives to have them photographed, which would greatly facilitate their being found should they be lost.

Chief Justice Daly has decided that a composition in bankruptcy does not become effectual and discharge the bankrupt until the composition notes are paid.

Mr. Steele, the well-known Hartford jeweler, has just completed his residence, which is said to be one of the handsomest in the State.

John C. Simmonds, one of our most skillful watchmakers, has entered into an engagement with Messrs. Hall, Nicoll & Granbery, to take charge of the watchworks.

Ex-Queen Isabella will sell in July in Paris a large portion of her finest jewels, the value of which is estimated at $2,500,000. The Spanish Government allows her $150,000 a year.

In the year 1714, after France had met with serious military defeats, Louis XIV. sent all his silverware to the mint to be melted up. He afterwards used Rouen faience at the royal table.

Mr. William Gibson, of Belfast, Ireland, whose exhibit of rich jewelry at the Centennial attracted so much attention, has made arrangements for a similar display at the Paris Exposition.

Mme. Alphonse de Rothschild has lately bought for $70,000 two exquisite works in bronze, attributed to Michael Angelo, which were found in an old house in Venice. They will be exhibited at Paris.

Mrs. A. T. Stewart is said to own the finest diamond in the United States. It is a 15-k. stone perfectly white, full of fire, handsomely spread, and is altogether a remarkably fine gem. It is valued at $35,000 to $40,000.

Keramos, from which ceramic is derived, means in Greek a horn, and potum, the Latin word from which pots, pottery comes means a vessel to drink out of. Evidently the ancients thought more of practice than theory in naming things.

Herman Reinecke, an old contributor to this journal, and an able and skillful workman, has entered into an engagement with Messrs. Alex. M. Hays & Co., to take charge of the mechanical department of their establishment in Union Square.

The art of the potter seems to have been of the first in archæological sequence; for we read in Scripture that God modeled Adam in clay, and the word Adam in Hebraic signifies red earth. No wonder innumerable books have been written on the history of the art.

The Horological section of the Geneva Society of Arts have resolved to hold an exhibition of tools for watchmakers, jewelers, musical box makers, and the various other trades therewith. It is to be opened shortly after the close of the Paris International Exhibition.

A curious etymology is that of the word ticket. It is an Anglicism of the French "etiquette" which has the same meaning. This word is derived from the old law formula "Hic est quest," an abreviation for "hic est questio," or "here is the lawsuit of," which formula was on all the labels posted on the different "blue bags" containing the papers relative to different cases. From "Hic est quest" to etiquette the translation is easy.

A writer in a London weekly states, on the authority of Castellani, that the finest jewels possessed by any private family are those of the Piombini—the house of Bon Compagni-Ludovisi. Many other Italian families have gems of immense value, although in other respects anything but wealthy.

The jeweled badge of the Order of the Crown of India is composed of the imperial cipher "V. R. and I," in diamonds, pearls, and turquoise, within a border of pearls, and surmounted by the imperial crown. It is worn on the shoulder, pendant from a bow of pale blue watered silk ribbon, edged with white.

The creditors of Isaac Herman, diamond merchant, have decided that the estate should be wound up by a trustee under the direction of a committee of creditors. Leopold M. Leberthon was elected trustee and the committee was chosen as follows: Isaac Bernstein, Michael Fox and Barfold Meyer. Fifteen claims were proved, aggregating $15,642.

William Owen, of Cincinnati, has been in town trying to effect a settlement with his creditors. Owen is owing some $19,000, and proposed to compromise on a 60 cent. basis. He subsequently started another paper at 40 cents, which his creditors did not take kindly to. So Owen is *owing* still, and thus he keeps *ohing* for things he has not, not contented with *owing* for things he has got.

The word porcelain is derived from the Portuguese "porcellana verbatum," a little pig, but which means also a cowrie shell or small cup, from the similarity of shape between the shell and the smooth back of the animal. Dr. Johnson makes it come from the French, "pour cent ans," for a hundred years which according to ancient documents was the time necessary to bring the paste to perfection while it was buried in the ground.

A Padua publisher is to send to the Exhibition an edition of Dante scarcely larger than the thumb nail, and intended for a watch-chain appendage. The letters are so small as to resemble grains of sand, and few, of course, can decipher them without a magnifying glass. It being impossible to distribute the type after the edition had been worked off, it was returned to the foundry. This Iliad in a nutshell will be bound in red velvet with silver clasps.

Terra-cotta is coming into fashion again, and is injuring the bronze trade to some extent. Le Boutillier, in Union Square, has some nice specimens. Among them the so often repeated children heads "Jean-qui-rit" and "Jean qui Pleure," which since they were remodelled by Francois, in the time of Louis XIX., have been reproduced in every shape. In this new edition, they are dressed as an infantry and cavalry soldier of the French army.

Large fans will be worn this season; those of last year measured eleven inches, now they are fifteen, and are intended to supply the place of parasols. The decorative part is executed *a la gouche*, and the subjects are birds, natural size. Among the floral adornments there are trails of fresh figs, dangling nuts, small pears, apples, almonds of fluffy, velvet and currants. They are not separate, but mixed, and these clusters are called *les restes*, or dessert remains.

At the last drawing room in London the Countess of Charlemont attracted great attention by her train and jewels. The former was covered with lace of extraordinary beauty, bought by Lord Charlemont for his wife from the execution of Cardinal Fesch, to whom it had been given by Napoleon I. The diamonds had been reset from designs by Dr. Schliemann, and the tiara was a counterpart of one which ages ago had, perhaps, appeared on a swell at the court of Agamemnon.

An old New York celebrity—for many years out of sight, has again appeared before the public under a new coat (of paint)—Atlas, who for so many years held time on his shoulders at 550 Broadway, when Tiffany & Co. resided there, is now again on exhibition with a clock over his head in the central window of their building on Union Square. If he could only obtain a little of Lincoln's surplus clothing he and the ex-president would be a match on the west side for Washington and Lafayette on the east. Decidedly Union Square is becoming the great art centre of New York.

Messrs. Tiffany & Co. desire us to state that the rumors circulated by certain unscrupulous parties to the effect that Messrs. Tiffany & Co. have discontinued the making of watches, and are merely closing out the surplus stock with a view of withdrawing from the wholesale trade, are entirely without foundation, that they are making for and selling to the trade a greater number of fine and complicated watches than ever before, and would consider it a great favor if reputable dealers would have the kindness to send to them the names of parties circulating such reports.

THE

Jewelers' Circular and Horological Review.

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THE

Jewelers' Circular & Horological Review.

THE RECOGNIZED ORGAN OF THE TRADE.

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More Copper than Conscience.

AN old philosopher being once asked to describe man, replied that "Man is an animal that is constantly striving to overreach some other of the same species." The philosopher may have been possessed of the failing of bluntness of speech, but his reply indicates a very thorough familiarity with human nature. It is a lamentable fact that, in these modern days, the ordinary business of life has come to be characterized more by what are termed sharp practices than by honesty and fair dealing. There is such a general desire for sudden wealth, to obtain something for nothing, prevalent among all classes, that honest industry is forced to compete at every turn with sharpers and tricksters. Business has become a contest between plodding honesty and keen, quick-witted and unscrupulous dealers, and, in such a tournament, with the odds of superior numbers against it, plodding honesty is in a fair way to be driven to the wall. Unfortunately for the jewelry business, it offers greater temptations and facilities for unscrupulous dealers and sharpers than almost any other. The general public has so little actual knowledge regarding the products of the trade that it is easily imposed upon, and, as a consequence, the country is flooded with cheap goods, fair imitat ons of genuine articles, but possessed of little intrinsic value of their own. Many manufacturers, finding that there was a profit in so doing, have consented to degrade the standard of their products, and have thus aided in killing the goose that lays the golden egg. There is scarcely a branch of the jewelry business that has not been invaded by the unscrupulous manufacturers, and to-day the trade in general suffers at every point from their irregular and dishonest transactions.

A very noticeable feature in this deterioration of standard goods is to be found in the manufacture of watch cases. It used to be accepted as a fact that if a watch case bore the stamp "18 karat," the gold of which it was manufactured was really and honestly 18 karat gold. But such is not the fact regarding many of the cases now made bearing that mark. It may be a gold case, to be sure, but it is liable to contain half a dozen different qualities of gold, varying as to fineness from 18 to 10 karats; the back and front may be 18, the rim 14, and the inside 10 karat gold, but, if stamped at all, is sure to be marked with the higher figure. Others are made of 12 or 14 karat gold, but are unblushingly stamped with the mystic number, 18. Such cases contain, usually, far more copper than conscience. It is unfortunate for the trade that the "karat" in this country is not a fixed standard, made so by law and insisted upon by the government, as it is in England. Here a manufacturer is at liberty to make his own standard for the karat, and in selling his inferior goods, satisfies his conscience by giving the assurance that "this is what *we* call 18 karat gold." Silver is less susceptible to the wiles of the tricksters, for a comparatively small amount of alloy destroys its color, but gold may be degraded 10 or 15 per cent. without its being particularly noticeable. A manufacturer possessed of an elastic conscience can, without running much risk of detection at the hands of the public, degrade his wares in this manner, and palm them off as the genuine article, putting upon them all those marks which should be a positive guarantee of genuineness. And this is done to an extent that is highly injurious to the trade, and is rapidly bringing reproach upon the jewelry business. Some manufacturers who have made excellent reputations in the business, and from whom better things were expected, have lent the sanction of their names to this degrading process, passing off their goods upon a credulous public as of a higher standard of value than they really possess. But, like chickens and curses, the evils produced by such practices will come home to roost, and, in the end, these manufacturers will find that in truth they have killed the goose that laid the golden egg.

It is by no means the manufacturers alone who are responsible for this condition of things, but some of the prominent jobbers find it so much to their interest to handle this class of goods that they prefer the spurious to the genuine, and encourage the manufacturers to produce the spurious.

There seems but one way, under the circumstances, for honest dealers to adopt to protect themselves from these dishonest practices, and that is to attach a certificate to their goods, guaranteeing the quality, and to warn the public against purchasing goods without such certificate from some well-known manufacturer. Were this course adopted, the public would have assurance that it got what it paid for, whether 10 or 18 karat as to quality. It is not to the cheap grades of goods that we take exception—these are as much a necessity to the trade and the public as the better grades—but it is the practice of imposing upon the public inferior articles bearing all the marks of the higher grades of goods. In the absence of any Hall mark in this country, the only possible protection which the public can have from the bogus manufacturers is to exact the certificates we have alluded to from the honest dealers, and to refuse to purchase goods without such certificate. Already some manufacturers have found it necessary to attach such guarantee to their watch cases, and the practice might be extended with advantage to other lines of goods.

But, while upon this subject, we desire to say that we think it entirely feasible and proper for the government to take cognizance of the frauds practiced in the manufacture of gold goods, and to establish a standard of value. While protecting the public against spurious goods, it might, at the same time, be made a source

of revenue to the government, for honest manufacturers would cheerfully pay a reasonable tax if they could be protected from the wiles of the designing and unscrupulous members of the trade. England has six standards for gold, viz.: 22, 20, 18, 15, 12 and 9 karats, and two standards for silver, viz.: 11 oz. 2 dwt. and 11 oz. 10 dwt. Each standard has its peculiar mark, and when this is affixed at the Goldsmiths' Hall, it is a guarantee that the goods are of that standard. Something of this kind might be adopted here. Let the government fix the standard of gold and silver, and the Collectors of Internal Revenue be required to fix the stamp of their grade upon certain classes of manufactured gold goods, the manufacturers paying a small tax for the privilege of having this seal of value impressed by the government upon their wares.

Penalties could be provided for counterfeiting the stamp, or for selling the classes of goods requiring to be stamped without such device upon them. The details for such supervision could be easily arranged, and the public thereby afforded a protection against fraud which they have never yet enjoyed. In effect it would cause all goods to be sold upon their merits, whether of the higher or lower grades, and would prevent cheap wares from being imposed upon the public for goods of the best quality.

England has displayed a great amount of ingenuity in raising revenues for the maintenance of the government, and it is to the fact that her aim has been to tax the luxuries rather than the necessaries of life that she owes her wealth, her power, and no small amount of her troubles in the past. For instance, her determination to get a tax out of the "potteen" manufactured surreptitiously by the Irish peasantry has had much to do with embittering the Irish against her. One of her most ingenious methods of raising revenue was the collection of the tax upon playing cards. For a long time, so it is said, the government made all the aces of spades, which was the occasion of that card always being more fanciful than the others. The manufacturers made the other fifty-one cards in the pack, but when they wanted the aces of spades to complete their packs, they had to buy them from the government, whereby the government got its revenue from this source with very little trouble. As England has had more experience in raising revenue, we may well study her methods, and among these her system of what is called "Hall marking," for watch cases, gold and silver ware, etc., should not be overlooked. There are made in this country from twelve to eighteen hundred watch cases daily, and, if these were to pay even ten cents each for the government stamp bearing a guarantee of its quality, a very handsome revenue would result therefrom. Honest manufacturers would cheerfully pay this tax, and the dishonest ones should be compelled to do so for the protection of the public.

As we have before remarked, the jewelry trade is one which offers peculiar attractions to the unscrupulous and dishonest. These dealers and manufacturers are a drag upon the honest manufacturers, destroying the reputation of all goods, discrediting those who seek to do a legitimate and honorable business, and imposing upon and swindling a confiding public. There are some manufacturers who have been driven to give quasi countenance to the practice of degrading the standard of their goods, who would be glad to tread once more the paths of rectitude and square dealing if they could be protected from the "ways that are dark" of those whose "tricks and manners" have forced them into disgraceful competition in order to save themselves from ruin. This is a legitimate matter for the government to take hold of, and, while Congress is so anxiously seeking for methods by which to increase the revenues of the government, we suggest that some attention be given to this.

Legitimate manufacturers and the public will be thankful for the protection which the government alone can give, and the dishonest and unscrupulous ones will be driven from the field.

In the older European countries it has been deemed necessary, from the earliest times, for the government to protect the jewelry manufacturers from the deceptive arts of swindlers and tricksters. In throwing its protection thus around legitimate industry, the public has, at the same time, received a degree of protection that it does not receive here. Gold and silver have a standard value, when presented in the form of coin, which the government protects with the severest penalties the law can provide. In olden time, counterfeiting was punishable with death, and, although this severe penalty has been abrogated, yet the crime is still considered deserving of the most rigorous punishment. Why should not the standard value of these precious metals be maintained in other forms as well as in the matter of coin? If a man is swindled by having a bogus watch foisted upon him, his loss is the same as though he had been victimized with so much bogus coin. England has recognized the necessity of protecting gold and silver manufactures from the wiles of the counterfeiter, and our country would certainly find a profit in following this example.

The CIRCULAR has at all times, in season and out of season, declaimed against the growing evil in the trade of degrading the standard of goods. Let the standard be what it may, whether of the higher or lower grade of goods, the goods should pass upon their honest merits. It is this practice of palming off, by spurious marks and brands, the cheaper grades for the better, that we condemn. It is this that has driven so many of the trade upon the shoals of bankruptcy, and it is this, more than anything else, that has brought the trade to the condition that it occupies to-day. The public has lost confidence in the trade, has grown suspicious of everything in the jewelry line, and regards pretty much everybody connected with the business as untrustworthy. These are unpleasant words to say, but they are true nevertheless, and the worst of it is that men still in the business are responsible for this condition of things. They have gone on degrading the standard of their goods till they have, to all intents and purposes, killed the goose that laid the golden egg.

The Jewelers' League.

THIS benevolent organization is, we are glad to learn, gaining daily in strength and numbers; and if we may judge of its stability from the opinion formed of it by careful, shrewd business men, it will certainly live long to bestow its blessings upon the widows and orphans of those admitted to its membership. The Executive Board has recently printed for circulation a list of members prior to April 1st, which includes the names of many prudent men who thus evince their abiding faith in this system of providing a fund for *post mortem* benefits, and especially of their faith in this particular institution. The names composing the membership of the League would lend additional honor to any association. They are men who are loving and lovable to their wives and little ones at home, and each would, if required, deny himself many comforts in order to provide for his family after he has gone to his long, long home. It is good to be associated with such men. The principles on which the League is based, have been too well elucidated by the many writers upon Life Insurance to require any additional light in this article; its purposes are accomplished more thoroughly than by the complicated schemes of an Insurance Company, with, however, the important difference that in the latter case exorbitant rents, salaries and expenses are paid, while in the Jewelers' League the work is done by its own interested members. It is easy to realize the difference in expense between doing one's own work, knowing it is well done, and paying another to do it for us and not know whether it is well done or not. Unflagging interest is shown by the members and its Executive Board, and the work is as energetically pushed forward as in the earlier days of its existence. We sincerely hope that the efforts which are being made with such a noble purpose in view may be seconded by the trade throughout the country, and that each employer will endeavor to interest his employés in providing for the comfort of his family in case of the loss of the "breadwinner."

A member of a well known house stated not long since that employers' *interests* would be subserved by their salesmen, artisans and assistants becoming members of the League, as requests would be less frequent to defray the funeral expenses, or to bestow oft-repeated charity upon the family of some improvident assistant; also that when a bereaved widow needs such material help as she can accept without wounding her pride and self-respect, the League comes to the rescue and affords instant assistance.

We hope that at the next session of the Board a large number of applications for membership may be presented. Information, blank forms of application and copies of the Constitution and By-laws will be cheerfully furnished upon application to the Secretary, Mr. James D. Yerrington, P. O. Box 4,001, New York City.

A Deserved Tribute.

ON Friday, May 24th, a number of gentlemen, members of the trade, met in the Park Bank Building, in obedience to a preconcerted summons. As the emaciated form of Mr. David Dodd was conspicuous among those assembled, it was surmised that a raid on the bank might be contemplated. Certainly his presence in such an assembly indicated trouble brewing for some one, and everybody was on the *watch* to see what would turn up, and who was to be the unfortunate victim. After several pauses, Mr. George C. White, Jr., of Rogers & Bro., was called to the chair and proceeded to state the grievance of the assembly in a manner which showed that, like all eloquent orators, he had come to the gathering of conspirators "wholly unprepared to say anything." Nevertheless he did say a good many good things, his remarks being aimed directly at the devoted head of Mr. P. T. Tunison, of the firm of Hodenpyle, Tunison & Co. The purport of Mr. White's charge against Mr. Tunison was, that the gentleman in question had been Secretary of the down-town Society during its existence, and had run the machine in a manner of which they proposed to take notice; that as the Society had now amalgamated with the Jewelers' Association, the services of Mr. Tunison as treasurer would no longer be required. But Mr. White gave him to understand that his associates were so delighted with the manner in which he had discharged his duties, and were so impressed with his sterling qualities as a man, that they proposed to recognize his virtues and abilities by something more substantial than words. Mr. White proceeded to eulogize Mr. Tunison in a most hearty and well-deserved manner, and concluded by presenting him with an elegant gold watch of Waltham make, bearing the following inscription: "Presented to P. T. Tunison by his fellow members of the Jewelers' Trade Association, in recognition of his official services gratuitously rendered as Treasurer, 1878." Mr. Tunison was quite overcome by this act of his business friends and associates. He acknowledged the gift in fitting terms, assuring the donors that he had simply striven to do a pleasant duty. He thought that their proverbial generosity had impelled them to the act rather than any special merit which he had shown. After the ceremony was ended all formality was thrown off, and flashes of wit and humor went the rounds for some time, so that the occasion was a most enjoyable one to all present.

The gentlemen present represented the firms of Aikin, Lambert & Co., Colby & Johnson, Saxton, Smith & Co., Chatterton & Dodd, Rogers & Bro., Alling Bros. & Co., Whiting Manufacturing Co., G. & S. Owen & Co., Enos Richardson & Co., Wood & Hughes, Fellows, Forster & Co., Schafer & Douglass, Wheeler, Parsons & Hayes, Sacket, Davis & Co., Hodenpyle, Tunison & Co.

Our Paris Letter

Dear Circular:

The big show is in working order, and the Paris Exposition of 1878 is an actuality. You have ere this heard how unkind Nature threw cold water upon the opening day, and how despite wind and weather the Marshal-President headed a procession of royalties through the mud at the official overture. At that time matters were *muddled* all around, but now things have got straightened out and in good order.

Comparisons are "odious," but not to be avoided in speaking of Expositions, and we have no reason to feel discontented with the past at Philadelphia compared with the present at Paris. It is true that the Trocadero displays more genius than the Art Gallery did, but there is nothing approaching the grand magnificence of the main building, while lack of space prevents the interesting features of the Centennial grounds. However, the general features of the Paris Exposition will be treated by abler pens than mine, and I prefer to confine my humble efforts to matters directly interesting to your readers.

Messrs. Tiffany & Co. make a superb display and have attracted a great deal of attention by the "Mackay service," which consists of one thousand pieces, and which cost $125,000. This is not to be wondered at, when the elaborate ornamentation is considered, which at once displays the enterprise of the firm, the ability of the designers and the skill of the craftsmen. Every square inch is covered with exquisite repousse work, and the only criticism is that the service is embarassed with richness of elaborate decoration; their Japanese work is also full of interest to Europeans, and has been greatly admired on all sides, while their general display of jewelry is fully up to the standard of any similar exhibits from the European firms.

Messrs. Robbins & Appleton have profited by their Philadelphia experience, and exhibit their wares in a cabinet worthy of the contents. Indeed it may be said that the American Watch Company make the best individual exhibit of watches in the Exhibition. The Prince and Princess of Wales spent a long time in the examination of these goods, and are said to have purchased three watches. The entire exhibit of Messrs. Robbins & Appleton has been sold to a Paris firm, and as an instance of the popularity already achieved in this line, I may mention that bogus American watches are on the Paris market, manufactured to gull the credulous public. I am informed that the Company purpose to open an American Agency, and if so the patronage which has been extended to their exhibit would lead me to infer that a permanent agency would prove a desideratum.

The British exhibits continue to be universally patronized, the crown diamonds and the Prince of Wales' collection being always surrounded by admiring crowds. So it is in the Gallery of Manual Labor, where 52 of the different trades claimed by France as specialties are represented. Among these is a diamond-cutting workshop, a number of looms, button and stud-cutters, makers of imitation jewelry and glass ornaments, and lace-makers, rarely without an appreciative circle of amateurs.

The following firms are represented:

Adams & Bromley, Victoria Works; jasper, majolica and Rockingham ware. James Aitchison, Edinburgh; Scotch jewelry. Geo. Betjemann & Co., London; silver toilet cases, clocks, etc. John Bragden, London; bracelets, brooches, chains, etc. Thos. Cooke & Son, York; telescopes, clocks, etc. W. A. Crouch, London; brooches, earrings, bracelets, etc. J. M. Crouch, London; silver brooches, bracelets, etc. Mrs. M. Dixie, London; morocco covers for jewelry, etc. Elkington & Co., Birmingham; electro-plated goods, repousse work in silver, damascene work in gold and enamel. Francati & Santamaria, London; jet ornaments and jewelry, mosaics, cameos and coral. Chas. Frodsham & Co., London; chronometers and clocks. W. Gibson, Belfast, Ireland; bog oak jewelry, chronometers, etc. Jeremiah Goggin, Dublin; bog oak jewelry, etc. James Howell & Co., London; decorative clocks, etc. James McCreery, Belfast, Ireland; bog oak jewelry. John Neal & Co., London; silversmith work, jewelry, watches, etc. J. W. Singer & Son, Frome, (Somersetshire); repousse silver, etc. Watherston & Son, London; jewelry and silver plate. Watson & Co., Bombay, India; gold and silver jewelry, etc.

The Swiss exhibit attracts universal attention, especially her display of watches, musical boxes, tools, etc., which collectively is a grand success. The exhibit is said to represent over three millions of francs. Mr. Favre Brandt, a well known Swiss maker of watches, has an interesting display of movements in every stage of completion. The Besancon watch factories are going to follow the example shown them by the Waltham folks at Philadelphia, and exhibit machinery, with gangs of 12 workmen, who will be changed every month. They are somewhat behind-hand in getting their machinery into position, but a fine display is expected.

Here for the present I must halt. There is much to be said in detail concerning the American exhibits, but I must content myself at this time with mere mention of the leading representatives of the trade. Besides those already mentioned, special reference should be made to the displays of the Seth Thomas and Ansonia Clock Companies and F. Knabe & Co., who represent the clock interests of this country; Aikin, Lambert & Co.'s showy display of gold pens and pencil cases is one of the features of the American exhiibt; Hagstoz & Thorpe's stiffened watch cases are universally admired; one of the most attractive displays in the Exposition is that of Peter Hartmann, the only American manufacturer of silver filigree work, which is noted for strength, beauty and elegance of design.

I hope in my next to furnish you with a complete list of the foreign exhibitors in the various departments represented by this journal, which periodical by the way I recognize as an old friend on the stands in the American department.

GOTHAM.

Repairing Musical Boxes.

By L. A. Grosclaude.—No. 3.

IN the two preceding articles, we indicated the manner of repairing all defects in a musical box. The mechanical part now runs well, the key-board is repaired, tuned and in good condition. Before indicating the form which must be given to the spirals of the key-board, and how to place the key-board itself in its right position, we offer the following suggestions.

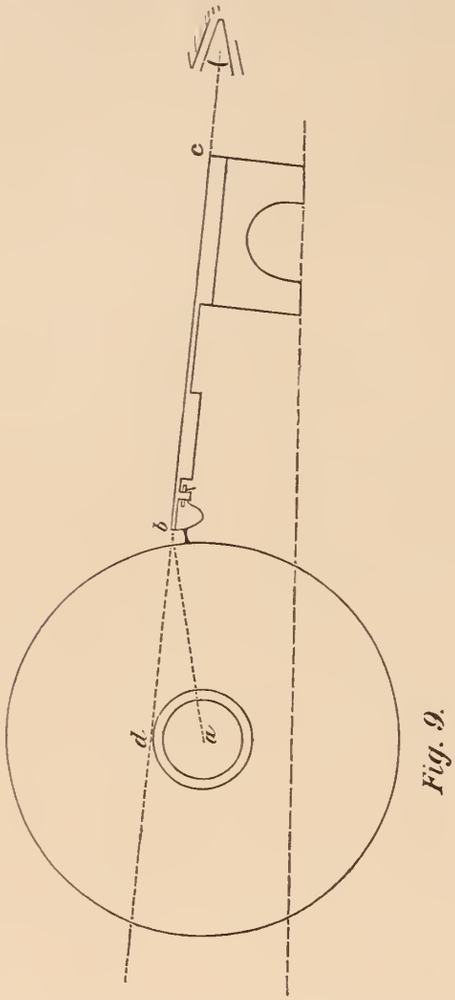


Fig. 9.

The cylinder must be free to move easily up the six, eight or ten tunes, as the case may be, and fall back readily to the first tune, being regulated by the spring (*boudin*) at the left end of the cylinder. But care must principally be taken that the axis of the cylinder (*tige du cylindre*) turns freely, but on the other hand it must have no play whatever to move lengthwise between the two bridges (*ponts*). If the least play exists, it will be utterly impossible to finish the box properly. The pegs of the cylinder must necessarily follow exactly under the points of the keys, if not the box will never play well. If any play be found, it will easily be removed by bending the legs (*pieds*) of one of the bridges (*ponts*) of the axis.

This done, the spirals of the key-board must be bent their right shape, and the key-board put in its proper place. I will, in a few words, describe the theory of the spiral, this being a very important part of the musical box. The manner in which these small steel stiflers (*étouffoirs*) are bent, contributes very much toward making an excellent box. The upper side of the key-board must always make the same angle of the radius of the cylinder passing through the points of the keys. This angle *a b c* must be 165 degrees, or which is the same thing, angle *a b d* equal to 15 degrees. It is not very easy to measure this angle, but in practice, the following will amount to about the same results. Supposing the diameter of the cylinder to be 24 *lignes* (French foot) (=54 centim.=2⅛ inches) *a d* must be 7 *cm.* (¼ inch). It will be observed that the upper level of the key-board *b c* prolonged will attain pretty exactly the summing of the spring (*boudin*) at the end of the cylinder. Supposing this to be the case, the spiral must have the shape indicated in Fig. 10 magnified.

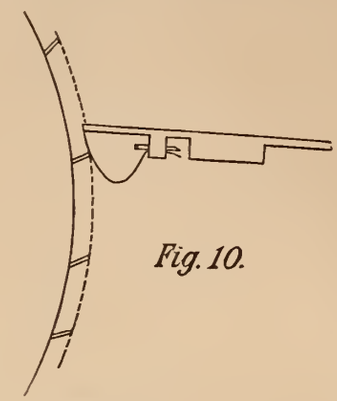


Fig. 10.



Fig. 11.

The end of the spiral must be as near the point of the key as possible without touching it. It must be observed that the heavier a key is (or the lower the tone,) the thicker must be the spiral, as it is more difficult to stop the vibrations of the key. As the cylinder turns, the peg will first touch the spiral at about the last third part, (in Fig. 10 the peg is at the place where it should commence to touch the spiral) the spiral will fall back, and when the peg has reached the end of the key, the vibration of the key will have stopped. If the spiral is too thin the peg will readily pinch it (it must then be changed), and will not sufficiently stop the vibrations, or if too thick, the spiral itself will produce a buzzing noise in stopping the vibrations of the key. To see if the spiral has a good shape and works properly, it will be best to let the box play slowly, the key-board in its place, and examine how the pegs act on the spirals, and see that they do not get out of place. Some practice will be necessary here, to find out if the spirals must be bent forward (when they do not sufficiently stop the vibrations) or backward (when they make too much noise, or are pinched). For bending these spirals a pair of pliers (Fig. 11) with a hook at each end will be necessary. It must not be forgotten that the shape and strength of the spiral, its distance from the end of the key, its place backward or forward, all have an importance which must not be overlooked.

The only thing remaining now is to put the key-board in its proper place: 1st. As to height. The dotted line, which is found on each cylinder, will here serve as a guide, but it must be observed that, supposing the shortest key to be on a level with the dots, the longest ones must be a little below, about the distance of half a dot. This difference in level gives the difference in "rise" of the keys, the longer ones necessitating more rise than the shorter ones. If this level should not be right, the key-board must be left as it is, and one of the bridges (*ponts du cylindre*) must be raised or lowered accordingly.

2nd. The key-board must occupy the right place, as to left and right. That is, all the pegs must pass directly in the centre of the points of the keys. It will facilitate matters to observe if the points of the keys pass at the same distance between the pegs of the two adjacent tunes. Should they not, the cylinder or the key-board must be shifted right or left; the key-board by bending the feet in the opposite direction, the barrel by filing or elevating the metal piece (*mentomet*) which rests on the tune counter (*ellipse*) placed on the inside of the toothed wheel of the cylinder.

3rd. A good rise must be given to the keys of the key-board; if they rise too little, they will have but little sound, and if too much, they will have a disagreeable sound, and moreover it will be difficult for the spirals to stop the vibrations, or they will make a noise and get pinched. At the same time it must be carefully examined if the different keys produce their sound at the same moment, that is in those parts of the tune when it is easy to observe that they should. This will be easily seen by letting the box play slowly. When the sounds are produced too late, the part of the key-board where this

occurs, must be put a little backwards, and if too soon, it must be put a little forwards. This is obtained by bending the feet (*pieds*) of the key-board in the opposite direction.

When the key-board is mended and tuned, it would be well to suggest that the spirals be bent only approximately, until after these last operations are completed, when the last touch must be given to the spirals in order to obtain a musical box, playing smoothly and agreeably.

After all this is done, it would be well to let the box play through all the tunes, and correct all the pegs that may have lost their right position, either right or left, by producing a disagreeable noise, by touching the end of the keys when they should not, or by playing too soon, or too late. When they play too soon, the pegs must be bent backwards, and when too late, forwards.

The case may happen that three or four tunes play quite well, and at the fifth one, for instance, all the pegs pass over the side of the ends of the keys. This will be corrected by touching that part of the counting wheel (*ellipse*) which gives the said tune.

Let us now resume, in a few words, the order in which all these different repairs are to be effected.

First, repair all concerning the mechanical part of the box, until, without the key-board, every wheel runs well. See that the axis of the cylinder has no play lengthwise, then that the cylinder moves freely on its axis. Repair all missing keys and points of the key-board, file the new keys half a tone too high, put all the points on a level and at the right distance from each other, place all the spirals, bend them appropriately, tune the keys definitely, put the key-board in its right place, finish the bending of the spirals to their proper shape, and then correct all pegs on the cylinder.

It often occurs, when a musical box plays, that the pleasure is destroyed by a continual buzzing noise, produced always by a piece of metal or wood not properly fastened. The best way to find out what part of the musical box produces this disturbing noise, is to let the box stop and make the keys resound from one end of the key-boar to the other with a rounded point; the notes which cause this noise will soon be discove ed, then continue with one hand to produce this sound, and at the same time with the other hand touch all possible parts of the box which seem to produce the noise, and as soon as, by touching, the noise ceases, the object has been discovered. Tightening the screw, or a drop of oil will very often do away with the noise.

If I may hope to have given a sufficiently clear description of the musical box, at least in those parts which are most necessary for persons having to repair them, the object of these articles will have been attained. I certainly cannot pretend to have explained all possible accidents which happen to musical boxes. Much more could be said about boxes with harmonium sounds, bells, drums, castanets, and also about boxes with changeable cylinders; but these certainly are few in number, while the explanations I have given find their application in all kinds of boxes.

Any further suggestions which may be desired, will be most cheerfully accorded, being well satisfied if I have contributed, in a small way, in securing to some persons the pleasure of having renewed a good musical box, which had been put aside for want of good doctoring.

The Tourmaline.

THE Tourmaline, although one of the most interesting of all the gems, is but little known, except to the mineralogist. Although known in the marts of Europe for many years, yet it has only been identified within the present century. The antiquary finds mention of it in the pages of the Greek philosopher Theophrastus, who notices a stone found in the Island of Cyprus, and which was emerald-green at one end and jasper-red at the other. Three centuries later Pliny speaks vaguely of violet and brown stones which when heated attracted and repelled light bodies, but after this date no mention is made referable to the tourmaline, and for seventeen hundred years it appears to have been completely overlooked and forgotten, until one summer day in the eighteenth century, some Amsterdam children playing in the sunshine with precious stones brought by Dutch navigators from the far East, were astonished to find that some of the gems attracted and repelled ashes, straws and other substances of little weight. They called their parents and the science of the Lapidaries was invoked. These wise men could not explain the phenomenon, but dubbed the stones *ashentreckers* or "ash-drawers." In 1727 M. Lemey exhibited the peculiar properties of these gems to the French Academy of Science, and in 1756 a similar display was made by Dr. Æpinus before the Academy of Sciences at Berlin. Subsequently an animated and lengthy discussion prevailed throughout Europe, eventuating in its demonstration as "Tourmaline," from *Tumali*, the Cingalise name of the gem. There are many varieties of the mineral. The red is known as rubellite, silberite or daourite; the blue as indiolite, the white as achroite and the black as aphrizite or schost—but the generic name of Tourmaline applies to all.

The finest specimens are found in Siberia, Brazil, Ceylon and the State of Maine. Purple, blue and green varieties come from Brazil, where it is mined, while in Ceylon, every variety save the black has been discovered in the grave beds of the secondary formation. Specimens are also found in Burmah, the Tyrol and Canada; but the most remarkable locality of the Tourmaline is in the town of Paris, in the State of Maine, near which is situated a little hill known as Mount Mica, which is one of the most remarkable mineral depositaries in the world, as it has yielded from an area thirty feet square, forty different varieties of minerals, some of them of extreme beauty and rarity. It was discovered in 1820, by two brothers named Elijah L. Hamlin and Ezekiel Hamlin, and a large number of gems thence collected, some of which are now in the Vienna Collection, and over a hundred remarkable examples have in all been obtained from this one spot.

The arrangement of color often observed in these minerals is very remarkable. In some of the crystals the red changes into blue and thence to green or black, or the red may pass into white and the white be tipped with green. Generally these transitions of color are imperceptible, but at times the line of demarcation is trenchant and well defined, so that the stone seems composed of sections veneered together. The Tourmaline frequently displays the effect known as polychroism in its greatest perfection. Some of its crystals when viewed parallel to their axes appear to be of one hue, which, when the prism is slightly turned, vanishes as by magic, to be replaced by a tint totally different, and the crimson tourmaline becomes brown, lustreless and opaque when viewed by candlelight. On the other hand, the green varieties are heightened in color and the blue are unchanged.

The optical characters of the Tourmaline are indeed wonderful. Some of its crystals are opaque when viewed in the direction of the axes, while limpid and transparent when viewed perpendicular to the side of the prism, and this when the thickness exceeds the length. Others are limpid from every point of vision. The Tourmaline also presents the peculiar feature known as "Polarization," and is used by scientists in their researches into the secrets of nature, while it is endowed with electrical qualities, as observed by the children of Amsterdam. It would seem as though Nature, in forming the Tourmaline, had wished to prove to man that she could imitate at once all her most perfect creations. She has endowed the Tourmaline with most of the colors observed among precious gems. From the wondrous hue of the emerald, its color passes in easy gradations to the dull shade of the plasma; from the gorgeous fire of the Pegu ruby to the opacity of jasper and porphyry; from the cerulean blue of the Ceylon sapphire down to the intense black of the carbonado. The Tourmaline embraces the whole range of tints, and it is a matter of wonder that its variety has not been better appreciated by the workers in precious stones.

Practical Hints on Watch Repairing.

By Excelsior.—No. 39.

THE SPRING-DETENT OR CHRONOMETER ESCAPEMENT—CONCLUDED.

(600) The stiffness of the unlocking spring being found correct, it is now to be brought to proper shape. From the enlargement at 2, Fig. 40, where it is screwed to the detent, it should proceed with as few bends as possible, and those only gentle curves, past any projecting parts, nearly to the point of the detent. Just before reaching the detent point it should be so curved as to bring the remaining portion of the spring exactly into the detent line, or line *am*, in our diagrams. The object of this is to secure an easy action between the pallet *n* and the end of the spring. By examining Fig. 40, it will be seen that if the spring points toward the right from *am*, instead of towards the balance staff center, it would butt more or less against the back of the pallet *n* in "passing," and the pallet point would dig into the spring and clog in unlocking. If the spring points to the left, the "passing" is made easier, but the unlocking harder. Of the two, it is better to point to the left than to the right.

(601) Instead of the point of the spring simply inclining to either direction, the whole end of the spring may lie either to the right or left of the line *am*, when at rest, with the detent locked. Even if the spring at its end is parallel with *am* or nearly so, the effect will be similar to that just described. When it lies at the left of the detent line, the passing will be very easy, but, in unlocking, the balance will have to move the detent back through an excessive distance in order to clear. If the spring lies at the right of *am*, the "passing" is made harder, while the angle of contact between the spring and the pallet *n* when moving to the right will be shortened, and may not be sufficient to move the pallet *p* out of the escape wheel circle, in which case it will fail to unlock. If the spring stands still further to the right, it may not touch the pallet at all, in which case, also, the watch will stand still, because there is no unlocking of the escapement. In any of these cases, if the banking of the detent has been properly adjusted, as directed in the wheel and detent action, the remedy is to bend the detent point to the line *am*, when it will support the spring there.

(602) In then adjusting the end of the spring in the detent line, or in testing the correctness of its position or shape, (the balance being removed, but the detent screwed fast in place,) a thin straight-edge laid along the detent from the center of the hole *m*, Fig. 35, through the locking point on the face of the pallet *p*, to and over the detent point and the balance jewel hole, will be a guide for the direction of the gold spring. In the Swiss tangential detent, Fig. 38, the straight-edge cannot pass over the pallet *p*, but must reach directly from *m* through the detent point to the balance pivot hole, and the end of the spring is brought into the line *ao*. As *m*, in the Swiss detents, is the center of the detent arbor or staff, a semi-circular notch must be made in the straight-edge to admit the arbor, so that the line of the edge can run from the center of the arbor to that of the balance staff hole, by which it can easily be seen whether the end of the gold spring points to the latter or not.

(603) The position of the point of the gold spring may also be tested with the balance and the detent in their places, and the escape wheel removed. Move the balance very slowly to the left and notice the exact instant when the unlocking pallet begins to move the spring, in "passing." Notice the angular movement of the balance from that point till the spring drops back against the detent point. Then move the balance to the right till the jewel and spring again touch, and observe the angle which the balance traverses from that point till the detent drops back against its banking screw. If these two angles are equal, the unlocking spring is properly placed relatively to the balance center, for only when on the line of centers, *am*, can its intersection with the pallet be equal on the two sides.

(604) The escapement being correct thus far, the pallet *n* should be just free from the gold spring, on the right side, when the balance is at a free rest and the wheel locked, as is shown in Fig. 40. This can be tested by a slight variation of the foregoing test. Notice the position of some point on the balance rim when the balance is at a free rest. Then, moving it to the left, observe the angle from that point till the jewel *n* touches the spring, and also from this latter point till the spring drops. These angles should be, in an English chronometer, from 2° to 4° for the former, according to the shape of the back of the point of the pallet *n*, as the more blunt it is the sooner it will touch the spring; and for the latter, the corresponding angles should be from 10° to 8°. In the Swiss construction, the angles should be from 4° to 6°, and from 12° to 10°, respectively. If the former distance is more than 5°, in the English style, or 6° for the Swiss, the pallet *n* is too far to the right and should be moved around nearer to the spring, by turning its roller on the balance staff. If the latter distance is greater than 10°, (or 12°, with the Swiss detent,) the pallet should be moved in the opposite direction.

(605) The total motion of the balance, from the point of rest to pass the gold spring, in order to enable the escapement to be unlocked and an impulse given, should be 12° in an English chronometer, and 16° in the Swiss style. The reason for this larger angle in the latter, is that the third tooth from the impulse roller is locked in the Swiss, instead of the second, as in the English, which compels the point of the detent to go through a greater angle than in the latter in order to move the locking pallet back the same distance, to clear the wheel. This gives, on an average, a motion of 11° to the left for "passing," from the point of *contact*, and about 16° to the right, from the same point, on the other side, to clear the spring. Of this latter distance, 10° is ample for carrying the pallet *p* out of the wheel circle and unlocking the wheel,—the remainder being extra motion of the detent, given to insure complete unlocking in any case, and to prevent the pallet dropping back too soon, (607.) It will not be necessary to describe the Swiss construction of this action any further, as the directions for testing and adjusting the English style will generally apply equally to this.

(606) The position of all the parts being correct, we have finally to see that the gold spring is neither too long nor too short. If the spring is too long, the pallet *n* will have to move it unnecessarily far in both directions, in order to clear or discharge, causing needless resistance to the motion of the balance. When going to the left, the balance has only the resistance of the gold spring to overcome; but when going to the right, it moves the entire detent against the increasing pressure of its spring, and the release of the detent being delayed, there is more liability of its failure to reach its normal position against the banking screw in time to properly receive and lock the next tooth of the escape wheel. Should the angles found in the preceding tests, (604, 605,) be greater than there stated, the excess is probably due to the spring being too long, and can be eliminated by deducting an equal amount, (say 1°, 2°, or whatever may be necessary,) from each of the angles found, which will leave them as there stated. Smaller angles will in the same way be compared by adding an equal correction to each, to allow for a short spring.

(607) If the unlocking spring is too short, it will clear the pallet *n* and release the detent so soon that the locking pallet *p* will be liable to foul on the back of the tooth just escaping from it. The unlocking jewel *n* should carry the gold spring (and of course the detent) a few degrees on after the tooth escapes from the pallet *p*. The spring may even be so short as to fail to unlock the wheel properly from the shortness of its contact with *n*. And if there happen to be one or more teeth in the wheel which are a little longer than the rest, (from the wheel not being concentric with its pinion, or any other reason,) when they come around to the detent pallet *p*, the short unlocking spring may fail to complete the unlocking at all,—merely moving the pallet out enough to bring the tooth to the edge, but not far enough for it to pass off. In such a case the pallet will move out and back, under the pressure of the tooth, and the balance will vibrate until the resistance caused by the "passing" and (partial) unlocking overcome its momentum and bring it to rest. The watch would of course stop running at the first failure to unlock. Instead of this, when the tooth is brought to the pallet edge as above

described, if there is any chipping off or flaw in the edge of the pallet or roughness of the point of the tooth, the latter may catch on the pallet edge, leaving the balance free to vibrate, until some jar releases the locking tooth, when the tooth approaching the impulse roller will fall upon it and produce the effects noted in section (543), by tripping.

(608) If the total motion of the balance, going to the left, from the point of contact between *n* and *t*, is more than 12° for the English or 16° for the Swiss detent, the spring *t* is too long. It may be shortened either by stoning off the end, for minute changes, or by cutting off a piece for considerable changes. In stoning, use a fine, smooth, Scotch gray slip, very gently across the end in the direction from left to right in Fig. 40, being careful not to use force enough to bend it over the detent point, and to leave the extreme end, where it works on the pallet *n*, perfectly vertical or at a right angle to its length. Not only at the end, but throughout its length, the plane of its width must be kept vertical, not twisted over to either side. To remove a larger portion, lay it on a smooth flat surface, of very *hard* wood, or copper, and cut off a very minute slice with a sharp knife,—the blade being held vertically, and pressing directly downwards, with care to avoid either pressing or drawing endwise on the spring, which would bend it, or change the shape of its curves. As it is made of 18 karat gold and is very thin, it is easily cut.

(609) The unlocking spring may be lengthened, when required, in two ways. If its shape and direction have been already adjusted, as previously directed, the best way is to loosen the screw at the boss at 2, and move the whole spring bodily towards the balance staff. This will avoid disturbing previous adjustments, and, if carefully done, all will stand as before, when replaced. For this purpose it is common, in making the spring, to cut an open slot from the screw hole to the end, so that by simply loosening the screw at 2 a little, the spring can be removed and replaced. This slot should be no wider than enough to slide on the screw, to keep it in the same position sideways. When there is no slot, the screw hole can be filed out a trifle in the proper direction.

(610) But in fitting a new spring, or if the shape is still open for change or adjustment, and there are any considerable curves in it, an increase of working length and a better shape can be simultaneously gained by straightening out these curves a little, as the spring should vary as seldom and as little as possible from a straight line. Many workmen are accustomed to shorten up the spring, when required, by forming a curve more or less deep between the pallet ring *p* and the detent point, instead of having it nearly straight. But this cannot be considered good work, and should only be practised when one is uncertain about its effect and may have to lengthen it out again. These bendings and straightenings are injurious to the spring, besides that the end must be readjusted to point to the balance staff center after every change. If it is not, the injury done is still greater. If the workman knows what he wants to do, it will be both better and easier to make the final alterations by stoning off the spring for shortening it, and moving it up, for lengthening. It may be well to say here, that unless you have had considerable experience, you should never meddle with the unlocking spring except when sure that it needs alteration, and enough to pay for the time and trouble of doing it well, and readjusting it to correctness again afterwards. Being very particular, its making is only entrusted to competent workmen, and will generally be found nearly correct unless it has been damaged by careless handling. Even then it is not a fit object for experimenting upon, as every time it is bent such place is more or less changed in stiffness thereby, and a spring can easily be ruined simply by numerous bendings and corrections.

(611) Supposing the condition and shape of the teeth and of the pallets *f* and *p* to be correct, and the point of the pallet *f* to be exactly opposite the point of the tooth when the balance is at a free rest, as drawn in Fig. 40, we will now give the escapement a final test, with all the parts fastened in position but the mainspring not wound. Pressing the escape wheel gently forward with a bristle inserted in a light handle, we move the balance to the left till the unlocking spring drops, then very slowly to the right till the detent pallet *p* is carried away from the front of the tooth and the wheel advances. Hold the balance still exactly at that point, and notice the angle between that position of the balance and the one it occupies when at a free rest. As already stated, in the wheel and roller action, the balance should be 5° in advance of the point of rest when the tooth drops upon the impulse pallet. If the angle found by the present test does not vary far from 5°, it may generally be disregarded. But if the variation is as much as 2°, more or less than 5°, it is evident that we have made a mistake somewhere. Either the points of the tooth and pallet *f* do not meet when at rest, as drawn in Fig. 40, or the unlocking mechanism is at fault, and the tests should be repeated till the cause of the error is found and corrected. If the adjustment of the lap of the teeth upon the pallet *p*, Fig. 35, and of the length and shape of the gold spring and other parts just treated upon, have been completed as directed, we must infer that the error cannot be in the unlocking roller and pallet *n*, but must be in the position of the impulse pallet *f*, Fig. 40, and its roller should be turned upon the balance staff as required. When the wheel tooth 3 does not fall upon the pallet *f* till the latter gets more than 5° in advance of the point of rest, the roller should evidently be turned to carry the pallet to the left. But if the pallet is nearer than 5° to the tooth when the latter drops, of course it should be moved to the right.

(612) Having caused the wheel to drop at the proper time we may now repeat the above test with a slight addition, if we have either an angle-meter or an upright holder, but it is rather too minute to be done without these or some similar tools. At the instant that the wheel drops, as before described, we stop the balance and note its position. Then, still pressing the wheel forward, we move the balance very slowly *backward*, or against the wheel, till the tooth drops off the pallet *f*, and again note its position. If the tooth does not escape till the balance has been returned very nearly to the point of rest, it is evident that the fitting of the wheel and roller action is very perfect, and there is no unnecessary "play" of the parts. But if the balance can be moved only 1° or 2° back before the tooth escapes, then evidently the point of the tooth barely catches on the pallet when it drops, and the action is scarcely safe. The trouble is either a roller too small for the wheel, or the wheel too small for the roller,—or, if parts are correctly proportioned, then they are planted too far apart in the plate. The only easy remedy for this is is to practically enlarge the impulse roller by setting the pallet *f* a little further out, so that there will be a safe intersection. When moving the rollers on the staff, it should be remembered that chronometer makers are accustomed to place the balance arm in line with the pendant of the case when at a free rest, and if one of the rollers is correct when the balance is in that position, during any of the foregoing tests, the other one should be moved to make any necessary change.

(613) Although it has taken so long to describe the different tests, when the workman once fully understands their objects and operation he will be able to make them all in a very few minutes, and will have the satisfaction of knowing either that his escapement is in the very best order, or, if not, precisely what the trouble is. They can be made without special tools, in most cases, by calculation; drawing angles on a circle the size of the balance rim, and transferring the amount of its motion to the circle, to ascertain what angle that distance represents, (405.) But it is far better done with the angle-meter, (438, 440,) by which any desired measurement can be easily, quickly and accurately made. As full directions for its use have been given, both with the description of its construction, and under the heads of the detached lever (451 to 457,) and the duplex escapements (527, 528), the workman will find all necessary hints with each test, without further details. It may be well to say, however, that in measuring the "draw" of the locking pallet *p*, (558,) the movement is first secured to the bed plate with the lower point of the

meter arbor standing exactly over the locking point on the pallet face, *i. e.*, the place where the point of the tooth rests when locked. A very thin, straight claw is then fastened into the arm *l*, with one vertical side exactly in line with the arbor point. A piece of clock hair-spring, or a narrow spring from the top of a common pendulum rod, or any similar piece will do, but must be straight at least far enough to reach from the escape wheel pivot hole to the locking pallet. First get the side which is in line with the point of the arbor exactly over both the locking point on the pallet *p*, and the center of the escape wheel pivot, and notice the figure touched by the pointer *e* on the scale, or set the pointer to the middle O. Then move the arm *l* till the vertical side of the spring is exactly in line with the locking face of the pallet *p*. The pointer will show the draw of the pallet, or inclination of its face.

(614) Before leaving the subject of escapements, it may be observed that, by the plan we have followed in section (547) and subsequently, of drawing the escapement in its correct proportions, and then making the different parts to correspond, no mistake or defect can occur except through the neglect of the workman. But a different system is generally followed by chronometer makers. The movement maker having finished his part, it is given to the escapement maker, who first locates the escape wheel pivot holes. He selects a pinion suited to the fourth wheel, puts them into the depthing tool, and gets a correct depthing between them; then, with one point in the fourth pivot hole he marks with the other a curve on the escape wheel cock. Next he takes a brass piece of the size that the impulse roller is to be, gets a correct depthing between that and the escape wheel, in the depthing tool, and from the balance hole marks another curve on the escape wheel cock, as before. At the crossing of these curves he drills and sets the jewel; uprighting the bottom hole from the upper one. The escape wheel and pinion being fitted in, and the balance staff and its rollers finished, with the balance on, the detent and its attachments are made and adjusted into position, then the steady pin holes are drilled and the pins fitted, to hold it there. By this plan, certain sizes, more or less arbitrary and accidental, are chosen for the parts, and when made they are tried together, and the holes marked off for them. But by the method we have followed, the correct proportional sizes and distances of all the parts are found, according to recognized principles and the teachings of experience, and the parts and pivot holes are then made exactly according to these measurements. Even if the pivot holes are already located and jeweled, we can determine the best sizes for the different parts, to suit these center distances. While one is a philosophical and intelligent mode of procedure, the other may be characterized as working by "the rule of thumb."

615 The escapement being completed and correct, the timing follows. Although already alluded to, (567,) a few words may be added, concerning a difficulty found in most English chronometers: that of timing in positions. The weight of the detent, above the foot, being unsupported, there is a great difference in the labor of both locking and unlocking in the different positions, but more especially in unlocking. When the movement is held in the vertical position, with the line *bc'* upright, and *c'* at the top, (see Fig. 35, it is evident that the unlocking is effected against the combined weight of the detent and the pressure of the spring; whereas, in the reverse position, or with *b* uppermost, the unlocking pallet has only to overcome the pressure of the spring diminished by the weight of the detent,—a very material difference, if the detent is as much too heavy as is commonly the case. The remedy often followed, that of putting the balance out of poise, is one which should not be allowed, for this or any other purpose. It is therefore not necessary to give the process. The proper course is to make the detent as light as possible, then, the hair-spring being properly isochronized, the adjustment to positions will present no special difficulty. Of course, the Swiss bascule or pivoted detent is free from any unusual difficulty of timing in positions, as, owing to its being poised, the labor of moving it is practically the same in all positions,

(616) A word of caution may be of service. In taking out the balance of a chronometer, when the mainspring is wound, the train being held only by the detent pallet *p* locking a tooth of the escape wheel, the slightest touch against the detent point will of course free the wheel, and it will instantly begin to run down, till the detent pallet returns to its place and stops it. The result of this sudden stoppage may be breaking off the pallet, bending or breaking off the points of one or more teeth, or bending back the (English) detent spring, according to their strengths,—or all of these injuries may be done at once. Very likely the workman, if inexperienced, will make matters still worse by his efforts to repair the damages. All of this trouble can be avoided by simply taking the precaution to put a bristle into the escape wheel and lock it, before taking out the balance, in such a way that even when the detent is moved back the wheel cannot start. As it is almost impossible to remove the balance without stirring the detent, all old workmen invariably lock the wheel, first. But less experienced hands are apt to forget this, sometimes, and pains have been taken to give such directions for making the different tests as would remove this danger as far as possible, even in the case of beginners.

Gold Lace.

A FOREIGN contemporary says: Gold lace is not gold lace. It does not deserve this title, for the gold is applied as a surface to silver. It is not even silver lace, for the silver is applied to a foundation of silk. The silken threads for making the material are wound round with gold wire, so thickly as to conceal the silk; and the making of this gold wire is one of the most singular mechanical operations imaginable. In the first place the refiner prepares a solid rod of silver about an inch in thickness; he heats this rod, applies upon the surface a sheet of gold leaf, burnishes this down, applies another coating, burnishes this down, and so on, until the gold is about one-hundredth part the thickness of the silver. Then the rod is subjected to a train of processes which brings it down to the state of fine wire; it is passed through holes in a steel plate, lessening step by step in diameter. The gold never deserts the silver, but adheres closely to it, and shares all its mutations; it is one-hundredth part the thickness of the silver at the beginning, and it maintains the same ratio to the end. As to the thinness to which the gold-coated rod of silver can be brought, the limit depends on the delicacy of human skill; but the most remarkable example ever known was brought forward by Dr. Wallaston. This was an example of solid gold wire, without any silver. He procured a small rod of silver, bored a hole through it from end to end, and inserted in this hole the smallest gold wire he could procure; he subjected the silver to the usual wire-drawing process, until he had brought it down to the finest attainable state,—being, in fact, a silver wire as fine as a hair, with a gold wire in its centre. To isolate this gold wire he subjected it to warm nitrous acid by which the silver was dissolved, leaving a gold wire one-thirty-thousandth of an inch in thickness,—perhaps the thinnest round wire that the hand of man has yet produced. But the wire, though beyond all comparison finer than any employed in manufactories, does not approach in thinness the film of gold on the surface of silver in gold lace. It has been calculated that the gold on the very finest silver wire for gold lace is not more than one-third of one-millionth of an inch in thickness; that is, not above one-tenth thickness of ordinary gold leaf.

To Clean Tarnished Brass.—Cyanide of potassium dissolved in water is the usual method of cleaning tarnished brass. Give the article an instantaneous dip, wash with clean water, then with alcohol. If the article remains in the bath too long, the high polished surface becomes deadened, and loses its gloss. Chronometer balances are thus instantaneously cleaned. They may be dipped in the bath just as they are, without removing the hair-spring, and if carefully washed and dried off by alcohol no danger need be apprehended. The plates and wheels of French clocks and music boxes are quickly done in the same way; in fact, any tarnished brass work.

Precious Stones and Gems.

BY EDWIN W. STREETER.

THE total value of Brazilian Diamond produce from 1861 to 1867 was about £1,888,000. Some very interestin information has been afforded us by Herr von Tschudi concerning the produce of the Brazilian Diamonds; and we may consider it as authentic, as he himself visited the Diamantina, in the province of Minas-Geraes, in February, 1858. He observes: "The pivot on which Diamantina turns is Diamonds. I was present during the unexampled commercial crisis which extended from town to town, and country to coun try, with such disastrous consequences, and which fell with the weight of an avalanche on the inhabitants of Diamantina. All business was stopped, and Diamonds fell to one-half the price they reached only the year before. I have taken much trouble to obtain an accurate statement of the present position (1859) of the Diamond trade in Brazil, and for that purpose have consulted the best authorities. The Diamonds of Brazil are known in commerce as (1) Diamantina Diamonds, and (2) Cincora Diamonds. The latter are of less value than the former, because they are not of such pure water, nor of so good a shape. In Matto-Grosso, the Diamonds are small, but of the purest water, and in their rough state have a peculiar lustre, which is seen in none other of the Brazilian Diamonds."

The panic alluded to by Herr von Tschudi was severe, but it is very doubtful whether in those remote times any panic was ever equal in extent and importance to that caused by the discovery of the riches in the Transvaal, Africa, which occurred in the year 1868, and which in 1870 caused the great revolution in the Diamond market. For some time after the discovery of the South-African riches, the Brazilian Diamonds held their ground well in the market; but the great gains that accompanied the introduction of the Cape stones soon diverted the attention of the trade to the latter, and traders and speculators were completely fascinated by the Cape stones. The lapidaries of Amsterdam for a long time would cut none other.

No country was more incredulous about the prodigious yield of the Transvaal mines than Brazil, and thus it was that the loss became disastrous to the Brazilian merchants, who refused to receive the warnings sent in perfect good faith. The favoritism bestowed on the Cape Diamonds, the great margin of profit which they yielded through being brought to market by all kinds of holders, ignorant of the ways of the Diamond trade, and of the value of the stones, could not fail to cause the Brazilian Diamonds to be more and more neglected; and as the difficulties created by the Amsterdam lapidaries increased, so the neglect was heightened, causing a greater depreciation than the prices demanded for the Cape stones really justified.

There were speculators who had been hoarding up Brazilian Diamonds, so that when the supply from the Cape rose above the market value, these hoards were resorted to for easing the market, and bringing back prices to a more uniform scale. This manœuvre finally proved successful.

The Cape yield of large stones enhanced the difficulties of influencing the Amsterdam lapidaries. They, finding a superabundance, refused to cut small ones, and these Brazil furnished in every parcel with which the merchants supplied the market. The merchants of Brazil had, therefore, to exclude all small stones, and contrive to compose their parcels so as to enter into competition with Cape gems. They have not succeeded yet, not because in beauty and quality the Brazilian Diamonds had deteriorated, but because of the exorbitant price at which they have been offered for sale. These high prices are mainly owing to the increasing scarcity of stones, as the working of the mines has become less remunerative.

The future appears to be decidedly unpropitious for the importation of Brazilian Diamonds, so long as the prices of Diamonds generally remain at their present level. A very considerable rise would alone induce a resumption of the working of the mines in the Diamond districts of Brazil, where none the less untold treasures are still hidden.

INDIAN DIAMONDS.

The Diamond fields of India have been celebrated from remote antiquity. The extent of the Diamond-alluvial formations has suggested to Karl Ritter to divide the formation into five groups. He explains not only the topography of the several districts, giving a history of the Diamond as far as he could from careful study of ancient and modern literature, but he has also collated the opinions entertained upon the origin of the Diamond, and notices its geological condition.

From his writings we select some passages. Thus, referring to Heyne and Voysey, Franklin and Adams, he says, "They are agreed that there is everywhere only a superficial layer of alluvial soil, a conglomerate of rounded pebbles, a sandstone-breccia, which contains the Diamonds. Further, that the Diamonds are by no means scattered throughout this conglomerate (breccia), but occur only in one particular stratum, harder than the rest, and, at most, only one foot thick, and this is so throughout the whole of India, wherever the Diamond is found. Voysey, who calls this rock a sandstone-breccia, says it lies under a firm sandstone bed, and consists of a fine mass of fragments of Red and Yellow Jaspers, Quartz, Chalcedony, and Hornblende of different colors, bound together by a silicious cement. This passes into a looser pudding-stone, with pebbles cemented with clay or marl, and this is characteristic of the Diamond bed."

This rock has been erroneously called Amygdaloid or Wacke, whereof certain conical hills of the plateau are formed, but never the flat-topped and gravelly hills, in which Diamonds are seen.

The same kind of formation of conglomerate spreads southwards from the Pennar, on the east side of the table-land, through Mysore, from Arkote westwards to Chittledrug and Flurrihur, but this tract contains no Diamonds.

In the time of Mohammed Ghori, who in 1186 was the real founder of the Mohammedan dominion in India, the quantity of Diamonds in that continent was so great, that he left in his treasury at his death Precious Stones to the weight of 400 lbs. These, it is reported, he obtained exclusively by plunder. Since the beginning of the thirteenth century these have been scattered; and at the finding of the celebrated stone called "The Great Mogul," Diamonds began to fetch a high price.

The discovery of the Diamond regions in America had little influence in depreciating the gems of the Old World; but the discovery of the rich Brazilian Diamond deposits could not be ignored.

The most southern group of the Diamond strata begins at the environs of Cuddapah, on the Pennar. Here for many hundred years Diamonds have been met with in greater or less abundance. They are found in many places near to each other: at Cuddapah, on the Pennar, and at Condapetta and Ovalumpally; also at Landur and Pinchetgapadu; and still further beyond the Pennar Valley as far as Gandicotta, and according to Rennell, even to Gutidrug.

Near Cuddipah (475 feet above the sea), the conglomerate is superficial, and from ten to twenty feet thick. The mountain rises 1,000 feet higher than this stratum, and its foot is everywhere covered with loose pebbles. The beds follow each other in the following order: uppermost a foot-and-a-half of sand, grit and loam; then a tough blue or black muddy earth, without any stones, four feet thick; under this comes the Diamond bed, characterized by the numerous large round stones embedded in it. It is from two to two-and-a-half feet thick, and consists of pebbles and grit bound together by loam.

In the neighborhood of Ellore, this layer is covered with a thick calcareous tufa. The stones are of various kinds, and the Diamond seekers give them special names: 1st, "Tellœ Bendu," white, earthy, subangular; 2nd, Transparent quartz, yellowish; 3rd, Pistazite; 4th, "Gajja Bendu," red, blue and brown Jasper pebbles; 5th, "Karla,"

basaltic pebbles; 6th, Sandstone, with ochreous crust; 7th, "Kanna," rounded ironstone, about the size of a hazel nut, which constitute the most important pebbles in the Ovalumpally Mines; 8th, Corundum. In the more northern Diamond pits, at Pastal, near Ellore, on the Lower Kistna, pebbles of Chalcedony and Carnelian also occur.

At Cuddapah, blocks of Hornblende as big as one's head, and mostly derived from the neighboring mountain chain, constitute the chief mass of the Diamond bed.

The Ovalumpally mines, also on the right bank of the Pennar, are a few hours' journey only west of Cuddapah. The Diamond bed here seems to follow the course of the river, and is of varying width. Here the Diamonds always occur rounded. Those found still further west are the best.

The Hindoos divide Diamonds into four classes, according to their castes. 1st, *Brahma*, of clear and "pure water." 2nd, *Chedra*, clear and of the color of honey. 3rd, *Vysea*, cream-colored. 4th, *Sudra*, a greyish-white. The Sudras are the Diamond-seekers who carry on their work without inspection, and pride themselves on their honesty. The pits which they dig are square holes, not more than sixteen feet deep.

Only fifteen miles north of the foregoing, at the north end of the same table-land, extending on the west side of the Nalla-Malla hills, as far as the town of Randial, (672 feet above the level of the sea,) lies the second group, under similar climate and condition to those of the former. The Diamond beds here are only about a foot thick, and both the over and underlying beds are more pebbly than in the first group.

Most of the Diamonds of this district lie loose, and have the crystallized forms of the double pyramid and the dodecahedra. In the rainy season the miners work in the Diamond pits on the heights, and when the floods are over, on the low-lying mines by the Kistna.

To the Ellore group belong the celebrated Diamond mines of "Golconda," famous for their antiquity, no less than their valuable yield. The name "Golconda" is scarcely correct, as the locality is at a considerable distance from the hill-fort of Golconda.

Formerly there were many mines here. There were when Tavernier visited the spot in 1669, as many as twenty; but now all except two or three have been forsaken, and the names Tavernier gave them so obsolete that it is with great difficulty they can be traced. They were partly west of Golconda, towards the middle tributary of the Kistna, where stood Raolconda. Other mines were to the eastward, on the Lower Kistna. The most famous of these, named "Gani" by the natives, but "Colore" by the Persians, was about fifteen miles north-west of Masulipatnam; and, in Tavernier's time, employed 60,000 workmen. The Diamonds found here were distinguished for their number and size; but, except in rare instances, they were deficient in purity and clearness. The largest and most celebrated found in this mine is described by Tvernier as the "Great Mogul." In its rough state it weighed 787½ karats. It was reduced by cutting to 297 karats.

Near Colore, or Gani, a locality is mentioned by Tavernier as having produced *inadamantine* Diamonds, whose brittleness led to great disappointment, and eventually induced the King of Golconda to close the mine.

The Use of Enamels for Ornamenting Watch Cases.

BY FREDERIC VORS.

WATCHES, ever since their invention, have been thought worthy of expensive and elaborate cases, especially if the works were of elaborate and expensive workmanship. We find that some of the old Nuremburg time-pieces are encased in rock crystal, elaborately cut and decorated with vitrified colors or enamel, fused into small cuts made in the crystal. These cuts or receptacles were lined with gold foil, which, when the work was finished, appeared round the rim of enamel color as a small line of gold, and produced a charming effect. Later we find the French craftsmen decorating the backs of watches with that peculiar style of work termed "*Email a la goutelette.*"

For this kind of work the metal was prepared in a manner similar to that used for "*cloisonné*" work, spaces for the different colors being separated by threads of metal standing on edge. The designs of most of the pieces we have seen, and these are not numerous, but few specimens of the work existing now, are of an Oriental character, and the space between the "*cloisons*" is exceedingly small.

The process of enameling consisted in heating the metal before the enamel was applied, and dropping enamels fusable at a low temperature into the different spaces they were to fill. The drop of enamel was made to run or was guided in the proper channel, before it cooled, with a metal point heated to a suitable temperature. Work of a similar nature has been used recently and with very pleasing results on the backs of expensive cases, though the *modus operandi* differs from that of the old French emamelers of the sixteenth century. The metal is again prepared as it is for "*cloisonné*" work, and the first charge of enamel fired. When this is done at the bottom of each cell is left a drop of vitrified matter which is glassy and brilliant like a drop of colored crystal; to obtain the desired effect it is necessary to destroy this vitreous aspect and to give the enamel the appearance of ground glass. A small piece of wood dipped in hydro-fluoric acid and rubbed on the enamel will soon produce the desired effect. For some purposes the divisions between the colors may be made, like in the Russian enamels we admired so much at the Philadelphia Exhibition, by fine wire cords made of two or more strands closely twisted together; if during the process of enameling the inequalities of the metal forming the ropes get filled with enamel, the piece of wood and the hydro-fluoric acid again come to the assistance of the workman to remove any superfluous enamel.

The enamel known as "*Taille d'épargne,*" or *reserve cut*, has been used more than any other for watch cases of a less expensive character. Black or dark blue enamel lines, with light ornamental leaves are often worked in with engraving or flat chasing. "*Cloisonné*" enamel, in imitation of the Chinese, was used in Paris for watches and jewelry at one time, during the second empire, but soon went out of fashion.

In the days of Louis XIV. of France, when color was an important element in dress and personal adornment, enamel was used to a large extent to ornament the backs of the ponderous watches so fashionable at that time. Some were enameled in colors so strong as to recall the gorgeous badges of the different orders of knighthood. The decoration in those days consisted generally in a translucent and vitreous enamel laid on the engraving or engine-turned gold of the watch case, termed by the French "*guilloché.*" This work showed through the enamel and produced a fine effect. Later, during the period of Louis XVI., figures and ornament in opaque enamel were introduced, the groundwork or background being, as described above, of translucent enamel, usually of a dark color.

Under Louis XIV. the celebrated "Rococo" style was prominent, and watch backs were studded with enamels imitating precious stones, principally turquoises and rubies,—"*cabochon*" shaped, separated by scroll work of raised white enamel lined with black or blue.

In the present day many different applications of the art of the enameler have been made to the decoration of watch cases. On Swiss watches we find landscapes and allegorical groups of figures, and sometimes ideal heads painted, or boquets of flowers, on white enamel in vitrified colors. In aspect they resemble fine paintings on porcelain. Enamels in the "Limoge" style are also extensively used, but are more expensive; these are in white or very low colors on dark or black ground. They are well suited for chatelaines. Sometimes enamel is introduced to complete or carry out a design of which precious stones inserted in the gold form the principal motive. Thus in modern times has industrial art done away with double cases for watches.

Proceedings of the Horological Club.

A Distinguished Body of Watch and Clock Makers.

Fifty-first Discussion.—Communicated by the Secretary.

UNSAFE WHEEL AND PALLET LOCKINGS.

Secretary Horological Club:

If the theories of Grossmann and Excelsior are correct as to the Lever Escapement, viz.: that the locking of the pallet and escape wheel should be perfectly safe, then why don't the Waltham, Elgin and E. Howard Co.s make them so on their fine watches? I seldom ever find one that locks perfectly safe on both ends or arms of the pallets. Of course, if you shove the lever clear over against the banking, it will stay there, but if you only move the lever far enough to unlock the escape wheel, when the tooth drops on the other arm, the lever will fly back. Will some member of your honorable body inform me if they are made on theory or not? H. P. B.

Mr. Uhrmacher replied that it was generally understood that the lockings should be safe, as Grossmann and Excelsior had stated. If the escapement acted as Mr. H. P. B. described, the depthing of the wheel and pallets was evidently scant, and one or both arms of the pallets must be set up towards the wheel, as required to remove the fault.

MAGNETIZED WATCH.

Secretary of Horological Club:

Would like to have answered, what to do with a watch that has been magnetized? I have one that all the steel parts are charged, as well as the springs; some days it runs too fast, and others too slow. G. A. C.

Mr. McFuzee referred G. A. C. to the Appendix ot Excelsior's book on the Balance Spring and the Compensation Balance, where a method was described for demagnetizing a watch whose steel parts are all charged, without even taking it apart during the process. Excelsior does not vouch for its efficacy, but gives it as recommended by a good authority on electrical matters, so that readers can try it for themselves. Another way is recommended, and the subject fully discussed, in the Club Proceedings in the Circular for July, 1875, and June, 1876. He would say that its running fast on one day and slow on another was no proof of its being magnetized, but it might have a very different cause, as was fully explained in Excelsior's book, with the remedies therefor, where Mr. C. would find full information on these subjects. It would be impossible to give satisfactory explanations within our limits in these pages, and every workman should have that book on hand for reference, not only on these but on scores of other points.

INSERTING PIVOTS.

Secretary Horological Club:

I was a little surprised to read Mr. McFuzee's reply to J. M.'s inquiry of how to insert a pivot and make it hold without soldering. I did not suppose that any workman of any pretensions would use acid to make a pivot hold, for it is almost certain to cause the pivot to rust and stop the watch. A better way is to drill the hole as deep as possible, and all the way of a size, then file the plug round and true, and with just the least taper possible, being sure that the taper is perfectly straight. When it will enter the hole to about two-thirds the depth of it, take it out and file with a sharp fine file square across the bottom end of plug one or two light strokes, turn half round and do the same. Then drive to the bottom of hole, and before taking off the pin vice, take the wheel by the edge or teeth and give the pin vice a gentle twist, and if the plug holds tight it will never move or get loose. If the plug should slip or turn in hole then take it out and file a little off of the bottom end, keeping it square. I have set hundreds of pivots in this way, and have never known one to get loose, and in some cases when they have been broken and required pivoting again, I have found it impossible to pull the old plug out with a pair of pliers. H. P. B.

Mr. McFuzee said that the method of pivoting described by H. P. B. was precisely the same as his. When the hole could be drilled in three or four times as deep as the diameter of the pivot, the plug would doubtless hold without any help. But often, from the piece being very hard, or some other reason, it was difficult to drill in more than 1½ times the diameter of the pivot. And with such shallow holes he considered it advisable to touch the end of the plug with soldering fluid, before driving it in, as he had described. After cutting off the plug it should be well brushed off to remove every trace of the fluid, and there would not be the slightest danger of rusting. He had not spoken before of this, because every workman knows that if a trace of it is left on steel it is sure to rust, and he supposed special directions to do that for it were unnecessary. But he was obliged to H. P. B. for calling his attention to it.

OLD WATCH CASE.—NAME OF BOOK.—POLISHING STEEL.

Secretary of the Horological Club:

The pamphlet which "J. S." inquires for I think must be one written by William Hanson and published by Miller & Stoppard, Binghampton, N Y., in 1867. I have one in my possession and it answers to his description.

Can the Club inform me as to the date of manufacture of an old watch I have, of which the following is a description? Silver open face double case, marked in back as per transfer attached. Movement is verge escapement, winds from the back. Plain dial, with circle of figures just inside of hour circle, showing day of month, which is indicated by a third hand placed on a wheel fitting over the wheel which carries the hour hand. The name on the movement is Medcalf, London, No. 7878.

Will some member of the Club give the different materials used for imparting that fine polish to hardened steel which we see in foreign watches? Jet.

Mr. Antiquary replied that, according to the description given, the watch case was stamped in Sheffield, England, in 1796 or 1797. The marks on the case, so far as we are able to make them out, correspond with the description of those of the above date given in the book of Hall Marks. The polish on steel was given with sharpe and rouge, the same as is done in this country.

REMOVING SET CAP JEWELS.

Secretary of the Horological Club:

In taking out the cap jewels of American watches the brass setting sometimes sticks very tight in the bridge. What is the best way to take them out in such a case? M. A. Morehouse.

Mr. Waltham replied that the best way was to run a pegwood point around the edge of the setting of the hole jewel, bearing on the brass only, not on the jewel,—and so push out both the hole and cap jewels, or push them up far enough to remove the cap, when the hole could be returned to its place. This was perfectly safe, and without danger of marring either the jewel setting or the cock. Many workmen pick the setting up a little, by using a sharp point in the recess for the screw heads, then raise it out by two knife edges or similar tools, prying up on both sides at once. Sometimes the screw holes are near enough to the edge of the setting to enable the latter to be pushed off by a fine point run through from the under side,—having first turned the setting a little to bring the full edge over the holes. But the first method was to be preferred, as it was as easy as either of the others. Even if it was not so, the rule should always be to follow a safe way, even if it was a little more trouble.

NEW YORK PRICES FOR WATCH WORK.

Several correspondents have written to the Club for price lists of work, representing New York charges, as prepared by Amaltheia last month. In answer to such we would say that the Club has no price list, and, for the reasons mentioned in the reply to Amaltheia, there can be no such list gotten up. Individual members of the Club have each their regular charges, but each one establishes his own prices. They are, however, under no obligation whatever to furnish lists to the Club, or to any one else except their own customers, and they unanimously decline to furnish them to any one for any such purposes as our correspondents want them for. We hope this will show our readers that it is useless to write to the Club for price lists, but they should endeavor to procure them of parties with whom they have dealings or acquaintance.

WHAT IS THE BEST LATHE?

Secretary of Horological Club:

I would like to ask Excelsior or Mr. Isochronal what in their opinion is the *best lathe* for watch repairing? I see several advertised in the CIRCULAR, and would like to have their opinion on the matter. W. B. C.

Mr. Isochronal said that they were all good lathes. The only way for a workman to get the very best one for his use, was to examine them, study their peculiarities and advantages, and select the one best adapted for the work he wanted it to do. It would be invidious for us to recommend one as better than the rest, even if we could do so. Different workmen had different ideas and preferences, and it was well that it should be so, and that every one should investigate and decide for himself. Also, see answer to a similar question in our report for September, 1876.

"Jeweler" also inquires how he can make a fine and true staff the best, on foot or bow lathe. This was a question on which workmen would differ. The old style workmen, (which included the majority of foreign-born workmen,) would insist that the bow lathe was far superior, for accuracy and perfection of workmanship, while the latter day workmen were equally positive in favor of the foot lathe A great deal of fine and good work had unquestionably been done on the bow lathe, but he thought that there was nothing that could not be done just as well, and more easily and quickly, on the foot lathe. A large number of jobs cannot be done at all on the former. He therefore thought its day was about over. He should always speak of it with respect, in memory of the good it had done, which no one knew better than himself, for he had been trained to its use and had worked upon it for many long years. But he thought that apprentices should invariably be instructed upon the foot lathe, and every workman who was not too old to learn and change his ways should get accustomed to its use as rapidly as possible.

WATCH MAKERS' TROUBLES.—NO. 2.

Secretary of Horological Club:

I will now state another annoyance to which many honest dealers in watches are often subjected. Some persons wishing to purchase, do not inquire before buying to whom they can apply to get the best or most reliable goods for the prices they may wish to pay, in fact, to get the worth of their money; or if the person with whom they are dealing can be depended upon, so that they may be treated in an honorable manner; but they go from place to place to find where they can buy the cheapest. In this they are perfectly right, providing they are good judges of watch work, etc. After having found what they think cheaper goods, frequently being gotten up in a more showy manner, they will say to the person who offered them a good and genuine article at a fair price, that he is extortionate, or that he has endeavored to cheat them. They do or will not consider that good goods and good workmen will always command fair prices, and that in buying cheap or below the real market prices, they will frequently get watches with fictitious or false names engraved on them. As for the quality of the gold in the cases, it is very difficult to say what it really is, unless it has been properly tried and tested in every part, many so-called 14 or 18 karat cases being very inferior. I have often seen *warranted 18 kt. fine* stamped upon gilt and oroide cases. Many low karat or inferior cases are gilt over, which gives them when new the appearance of being made of much finer gold than they really are. These kinds of watches are generally foisted upon private customers who wish to buy *very cheap*, upon inexperienced dealers, or upon persons who are in the watch trade, although they know no more of the business than buying and selling, or trading at a profit, to the great injury of the really honest and fair dealer, who, if he wishes to succeed in business and values his reputation, will never deceive his customers, either in the quality of the goods sold by him or charge an extortionate price. In these hard times there certainly may be some who may be compelled to offer goods at prices really below their intrinsic value; but still, if honest, will not deceive the buyer about the quality. This may be a warning to many country and small dealers, as well as to those wishing to buy *so very cheap*, that cheap watches will after all prove *very dear* ones, when they consider the trouble it may lead them to with their customers to whom they may afterwards sell them. Therefore let them be very cautious and particular to purchase watches only of responsible and reputable parties, of those that can be depended upon about the quality of the movements, as well as that of the cases. In my next I will state some of the troubles and vexations that watch repairers are often subjected to, no matter how skilful or honest he may be in the business, learned by a long

EXPERIENCE.

Mr. Clerkenwell indorsed the statements of "Experience," and added that, when he had a call from one of these shoppers, he said to him plainly that he would go around in that way and get the lowest price, and after he had bought it he would find that he had got cheated in the worst way. He could not judge of the quality, and some dealer would sell him a bogus watch, and word his warrantee in such a way that it would not amount to anything. Then what could he do about it? Very often, by making the customer appreciate the risk he ran, he could make a sale to him on the spot. But in all cases he offered a good article, at a price which gave him a fair profit, and told them that was his lowest figure,—they could take it, and feel sure that they were honestly dealt with, or they could try elsewhere and run the risk of being swindled if they chose.

"TIMING SCREWS."—CUTTING THE BALANCE RIM.

Secretary of Horological Club:

I would like to ask you which are the "timing screws" I read about in the CIRCULAR? Are they the ones across the arms of the balance wheel? Being a young watchmaker I am desirous of information. Also, do you think I can improve a Swiss watch by cutting the balance rim? The watch varies as much as five minutes in a week, and some weeks it will go correctly. G. A. H.

Mr. Horologer replied that the timing screws were the two at the ends of the balance arms. There were sometimes two others, half way between them, on the rim, called "quarter screws," which could be moved either for timing or poising. But the workman had better not disturb these unless he is well posted, as he may do great injury to the adjustment for heat and cold. Mr. H. would do well to get Excelsior's book on the Balance Spring and the Compensation Balance, published at the CIRCULAR office, in which are full particulars on this and all similar points.

As to cutting the balance rim, as he speaks of, the only object of doing so would be to lessen the effects of heat and cold upon the time of the watch. It might improve it, or make it worse, just as it happened. He would not recommend cutting it unless Mr. H. was able to make at least a coarse adjustment of the compensation. This subject, also, was fully treated in Excelsior's book. The variations in the running, mentioned in his letter, might be caused by entirely different faults in the watch. It certainly was, if it varied in that manner when the temperatures to which it was exposed were practically the same in the different weeks. He should first try it in exactly the same positions and with the same usage during two weeks. If the watch varied considerably when there was no alteration of the conditions in the different weeks, except change of temperature, then it might be ascribed to that cause. Whether it was or not could be very easily determined by a test in the adjusting oven and the cold box, according to Excelsior's directions.

DRAWING THE LEVER ESCAPE-WHEEL TEETH.

Secretary of Horological Club:

I am sorry that I must annoy Mr. Isochronal with this question. I would not do so, if I had not arrived at the conclusion that others also find it a little difficult, and by wording several lines differently it may be understood easily. Please find within a drawing. You will see at once that the club-tooth with its inclination is not right. I do not understand this line fully, Practical Hints, section 347: "mark 4° below *b*, measured from pallet center *d*. E. P.

Mr. Isochronal said that he had examined section (347), also the preceding ones relating to the detached lever escapement, and thought that the drawing would be correct according to the directions, for the stated amount and distribution of the lift of the wheel and pallets. Perhaps the passages referred to would be a little clearer if stated as follows: Having drawn the circle *xx*, and marked it off into fifteen equal parts, corresponding to the number of teeth,

we draw lines from *a* to each of these points,—one of these lines being *ab*, as marked in Fig. 18. Then draw as many more such radial lines, one 4° back of each of the former, as seen at *y* and *z*.

The breadths of the teeth are included between these pairs of lines. To draw the inclination of the teeth on their ends, mark a line 4° below the line *db*, from *d* as a center. From the point where this new line crosses line *ab*, strike a circle *yy*, with *a* as the center. The driving planes of the teeth are formed by drawing a diagonal line in each of these four-sided spaces, as shown at *y* and *z*. He trusted that Mr. P. would find this explanation sufficient, and assured him that no apology was necessary for troubling us, as our object is to give such information to our fellow workmen as they may need.

APPRENTICE BOTCHES.

Secretary of Horological Club :

In regard to the Jewelers' Almanac, spoken of by the Horological Club, it would be a good thing if gotten up without the objection spoken of: wholesale dealers' advertisements. But I do not see how you can get rid of the botch while all first class houses take apprentices, and after the first year trust so much to them. Of course, they are insulted after that if the boss does not ask them how this or that should be done. They are the worst botches we have until the conceit is taken out of them. D. D. K.

Mr. Clerkenwell agreed with D. D. K. about the apprentices. He thought that all *good* workmen should decline to take them, except on such terms as would justify them in devoting time enough to give thorough instruction. For his own part he thought it was cheaper and better to hire a good workman righ out, than to bother with an apprentice,—at least, if he had work to do. If a jeweler only wanted a sort of shop boy to do errands, tend shop, and do the dirty work, he ought to call it so, and not let any one suppose the boy was learning the trade at all. By following this course, the public would be protected, the parents be better satisfied, the apprentices would know something when they completed their term, and the trade would be saved from the disgrace which is now inflicted upon it by the botching of workmen who have "worked in the best shops."

He then spoke of a neat little 16 page pamphlet, sent in by the gentleman writing the excellent articles on Engraving, in the CIRCULAR. This *brochure* was gotten up by a private firm of jewelers, to give out to their customers, in the same way as the proposed Jewelers' Almanac, and showed that shrewd business men not only approved of the idea, but adopted it in practice. Of course an almanac printed for the whole trade could be made at a lower price than one firm could secure on a small number, and at the same time contain much more matter. The treatise was a credit both to its talented author and enterprising publishers. We should be pleased to receive other efforts in the same direction, as well as ideas and hints on the subject.

DIPLOMAS FOR GOOD WORKMEN.

Secretary of the Horological Club:

Allow me to suggest to your honorable body some means to kill out this butchering of watches which is done by inexperienced botches. In the JEWELERS' CIRCULAR for March, page 24, the suggestion made is a good one. I think that it should be rather difficult to gain a diploma, and the diplomas should be given by your honorable body; no watchmaker to be admitted unless he has given satisfactory evidence of his skill as a watchmaker, and has a decent set of tools. Good workmen can and will find sufficient evidence to your Club. The applicant's or petitioner's name to be in the JEWELER'S CIRCULAR three or six months or more, and then any watchmaker can give reasons why he should not be admitted for the same. He should have a diploma after learning as an apprentice three years, or working six years without a trade, providing he can pivot, jewel, etc., as good as new, by giving satisfactory evidence. If he can not give evidence, it is worth going to some practical watchmaker whom you may appoint, in his vicinity, and there to show his skill as a workman, he to pay all expenses, etc., as you deem proper. I for one will run my chances to give sufficient proof, and also apply for one. J. W. A.

Mr. Uhrmacher thought the idea of appointing some good watchmaker in the applicant's vicinity was a good one. So was the publishing of the names of applicants. Only it would necessitate the formation of a board of examiners, either national or city, to consider objections against any individual, and the result of his trial of skill, and decide whether to grant a diploma or not. This, however, would be foreign to the objects for which this Club was organized. The board should be composed of well known, capable and reliable workmen, elected or selected from the trade at large, and they must be paid for their services. Competent men would not serve for nothing, as their time is too valuable. But the total cost of getting a diploma need not be much, and it would *pay* for the workman to frame and hang up in his shop.

LETTERS LOST.

The secretary here reported that he had unfortunately mislaid or lost several communications which were intended to have been laid before the Club at this meeting. Correspondents whose letters do not appear in this or next month's Proceedings, may conclude that they have been lost, and are invited to repeat them. This is also a good opportunity for those who wish to ask questions, or who have practical information to give, to send in their favors. Having cleared the docket, as it were, we hope to attend to them more promptly in future than has been possible lately.

On occasions like the present, when business was disposed of, the Adjuster of the French School has been wont to entertain us with his verbal gyrations, and while away the vacant moments with his famous metaphysical peorations. But he is gone. His obdurate heart refuses to melt in pity of our forlorn and doleful situation. We feel that we have lost a great loss, and if he has a single drop of the milk of human kindness left in his soul, he will return forthwith to the horological sanctuary, and again regale our longing ears with those incomparable disquisitions on matters and things which have made his name a household word throughout the land. There being no further business before the meeting, the Club, with one long, sad, tearful, hankering sigh for the dear departed, then adjourned.

Extension Rings.

WE have much pleasure in introducing to the notice of the trade an entire novelty in rings and bracelets, which has recently been patented by Mr. George O. Street, of the firm of George O. Street & Son, of this city.

The invention consists in the combination as a finger ring, bracelet, or similar article, of a coil formed of one continuous elastic strand, cross-heads for guiding the action of the strand, and finger buttons by which the diameter of the coil can be increased or diminished at will, pressing the buttons together lessening the size, and separating them expanding it.



Fig. 1.



Fig. 2.



Fig. 3.

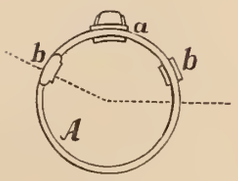


Fig. 4.

Fig. 1 shows a bracelet and Fig. 2 a ring, while Fig. 3 depicts the patent in section, and Fig. 4 shows a vertical plan. The two first designs will give an idea of the general appearance, while the last mentioned will explain the working. It will at once be seen that as the cross-heads *b* and *b* are made to approach each other, the bracelet can be made to suit any desired size.

Articles made under this patent are strong and durable; there is no snap or joints to get out of order. It is easily expanded to admit the hand and as easily closed by a slight pressure on the finger-buttons on the sides. The patent is specially applicable to children's finger rings, which can be altered in size as the wearer grows.

Workshop Notes.

An excellent red lacquer for watch hands is made of 8 parts (by weight) good alcohol, 1 part dragon's blood, 3 parts Spanish anatto, 4½ parts gum sandarack, 2 parts turpentine; digest (with frequent shaking) for a week; decant and filter; must be kept close.

Black Enamel is thus made: Peroxide of manganese 3 parts, zaffre 1 part; mix, and add as required to white enamel, which is: washed diaphoretic antimony 1 part; fine glass, free from lead, 3 parts; mix wet, pour into water, powder, melt again, and repeat this three or four times.

To Regild Watch Plates.—Clean them well with wet brick dust and wash in cold water. Immerse them in a solution of diluted sulphuric acid, rinse well in clean water, then hang them in a warm gilding solution for about two minutes; be careful to notice that your wires are well connected; scratch brush and they will appear frosted.

Silvering Ivory.—Immerse a small slip of ivory in a weak solution of nitrate of silver, and let it remain till the solution has given it a deep yellow color; then take it out, and immerse it in a tumbler of clear water, and expose it to the rays of the sun. In about three hours the ivory acquires a black color; but the black surface on being rubbed soon becomes changed to a brilliant silver.

To fasten a joint on a watch case, first remove the old joint and all of the solder with a joint file and graver; then select or make a piece of joint wire the proper size, and fit and clean; place the case on a piece of coal, lay on the wire and fasten together. Apply McLane's anti-oxidizer, the best preparation for soldering we know of, and put enough silver or gold solder, as the case may be, to solder it; then boil out in pickle, and clean, and fit the parts together.

A very good poising tool can be made by adapting to one end of the ordinary depthing tool two new centres of steel wire, about a half inch of the inner end of each of which is filed away somewhat beyond the diametrical line. Harden and polish these ends, and they will present when properly fastened in the tool by the set screws, a very nice sharp angle on which to poise the balance, the adjustment for the length of staff is of course made by the screw which opens the tool.

How to Temper Lifting Springs.—After the spring is fitted, draw-file it, and harden in oil. Then put it in a spoon, cover with sweet oil, hold over a lamp until the oil takes fire, passing it over the lamp at intervals to keep it burning, and let the oil all burn out. The author of this method states that he has employed it for over ten years and never knew a spring to break. He thinks, however, that the oil used, namely, sweet oil, may have something to do with his success.—*Revue Chronometrique.*

Metal Show Cases give jewelers a good deal of trouble in keeping them in anything like decent order. The best preparation we know of for keeping them bright is trlpoli the kind that comes in lumps can be had at Frasse & Co.) A pound of this will last a long time, and when properly prepared will be found useful in a great many ways. It must be reduced to a fine powder mixed in water, and applied with a piece of chamois-skin, and allow to dry, then clean off with a dry cloth or chamois-skin.

Cementing Metal to Glass.—Take two parts finely powdered white litharge, and one part of dry white lead, mix intimately, and work up with boiled linseed oil and lac copal to a stiff dough. One part of copal is taken to three parts of boiled oil, and enough litharge and white lead added to make a dough, similar to putty. The under side of the metal is filled with the cement and then pressed upon the glass, the excess of cement being scraped off with any sort of instrument. It dries quickly and holds firmly.

Mons A. Cadot, of Paris, gives the most simple method for securing dial-plates from injury while operated upon, and many a watchmaker will, no doubt, wonder why he did not think of it before: cut a sheet of paper the size of the dial, and glue it on to the dial plate after cutting through the paper an opening corresponding to the engraving, etc., which is required. Make the holes the proper size with a graver. Crushed pumice will serve for etching and rounding the angles, when the whole is polished with enamel powder or diamantine. The plate has then only to be put in water and the paper falls off. This method will give great satisfaction, as it is thus impossible to scratch the dial.

Many alloys of tin and other soft metals hardened by addition of antimony, copper, etc., do not give a clear tone on being struck, but a lead-like dull one. It has been found by M. Lilliman that the power of sounding clearly may be imparted to them, by immersing them for a half to one minute in a paraffine or oil bath, heated to a temperature of 5° to 5·5° below the boiling point, then taking out and allowing to cool. This does not produce any diminution of density, but a considerable increase of the hardness and rigidity.

Removing the roller from the main-wheel arbor in cases where it is screwed on, is sometimes troublesome, unless some convenient tool is at hand to do it with. Such a tool may be made in a few moments by taking a pair of old (or new) round-nose plyers, and grinding or filing the points to a size and shape that will take into the holes usually made in the roller for the convenience of unscrewing it; the plyers can be opened to any distance, and consequently will fit all sizes. Place the winding square firmly in a bench key held in the left hand, then apply the points of the round plyers in the holes in the roller, and by firm, steady pressure it will be easily unscrewed, with no danger of damage to any part.

The Resistance of the Air to the motion of the lever in the torsion balance does not seem to have received any serious attention from the experimenters who have measured the mean density of the globe with this balance. It has, however, a considerable effect in regular and rapid decrease of the amplitudes of oscillation. This has been demonstrated by MM. Cornu and Baille (*Comptes Rendus*), who find (1) that the amplitudes or distances of two successive elongations decrease in geometrical progression; and (2) that the epochs of the elongations are in arithmetical progression. A theoretical consequence from these laws is, that the resistance of the air is proportional to the first power of the angular velocity of the lever.

The *Druggists' Circular* recommends the following as a liquid polish for silver-plated ware:—Three to four drachms of cyanide of potassium, eight to ten grains of nitrate of silver, and four ounces of water. Apply with a soft tooth brush, wash the zrticle thoroughly with water, dry with a soft linen cloth and polish with a chamois skin. Neither whiting nor powder of any kind should be used for cleaning and polishing; they only waste or scratch the silver. In the case of solid silver, some English precipitated chalk is allowable in the solution. For preserving the luster of silver or plated ware when not needed for actual use for a considerable time, a coating of collodion may be employed to great advantage. The articles are to be heated, and the collodion then carefully applied by means of a brush, so as to cover the surface thoroughly and uniformly. It is used most conveniently when diluted with alcohol, as for photographic purposes.

Experiments with Nickel.—Some experiments have been lately made by M. Boussingault on cementation of nickel, a metal which has several of the properties of iron. While it combines with carbon in the process it does not (he found) acquire, like iron, the properties of steel—viz., hardness, resistance to traction, elasticity, etc. From Berzelius' statement that meteoric iron, which is always nickeliferous, retains its metallic clearness in damp air, M. Boussingault supposed that, by combining nickel with steel, the latter would be preserved from rust; he accordingly prepared steel with 5, 10, and 15 per cent. of nickel, but the alloys, placed under a thin layer of water, all rusted like steel without nickel, and sometimes even more rapidly. In these latter experiments he found he had been anticipated by Faraday. But with a large proportion of nickel, as in the meteoric iron of Santa Catharina, Brazil, which has 34 per cent., there is no oxidation. The magnetic properties of cemented nickel are being examined by M. Becquerel.—*Jeweler and Metalworker.*

Grinding Glasses.—Provide two pieces of cork, one concave and one convex (which may be cut to shape after fitting to lathe). Take a copper coin or other suitable article and soft solder a screw to fit the lathe, and then wax it to the cork; then get a twenty-five cent emery wheel, such as is used on sewing-machines, and you have a complete outfit for cutting your watch-glasses. Polish the edge on the zinc collar of the emery wheel, or use a piece of zinc to do it. The other cork should be waxed to a penny and centred. The spectacle lenses may be cut on the same emery wheel, if the wheel is attached to the lathe so as to revolve. Another method is to take a common piece of window-glass (green glass is the best), and make a grindstone of that, using the flat surface to grind on. Cement it on a large chuck, the glass being from 2 to 2-5 inches in diameter. Anyone not familiar with this method would be surprised to see how fast the glass is cut away, for either spectacles or watches. In grinding watch-glasses put them flat on the chuck-glass, not on the edge.—*British Jeweler and Silversmith.*

Foreign Notes.

A band of black velvet an inch wide, with pendant ornament, is one of the favorite necklaces worn by young ladies.

Basaucon, seat of the French watch industry, is to have a new observatory; the plans will be exibited at the Exposition.

The latest device for a lace brooch is in the shape of the point of a peacock's feather, the colors being outlined with rubies, emeralds and diamonds.

Silver combs are very generally worn by ladies who have dark hair. A pretty idea is to entwine the upper part of the back comb with small flowers, such as white violets, mignonette or anyosotis.

In an Italian magazine devoted to electricity, Prof. L. Ponci describes a battery which is said to be new, and of great simplicity. It consists of a glass jar and a porous vessel, the latter filled with a solution of ferrous chloride, and having an iron plate as a pole. The outer solution is of ferric chloride, with a carbon plate as a pole. Both solutions should be made up to a strength of 35° Beaumé. The electro-motive force is said to be nine-tenths of a Daniell cell.

An exhibition of ancient and modern products of the art of the goldsmith was opened in Gmund, the capital of the Swabian gold industry, on April 15. It is enriched with some of the fine works from the collections of the King of Wurtemberg and of Prince Karl of Prussia; the Gewerbe-Museums of Berlin, Stuttgart, and Karlsruhe have lent from their stores; while the churches, and the antiquarian collections of many towns, have also been large contributors.

Tiffany's exhibit is attracting universal attention for beauty and originality of design and perfection of workmanship. Nothing of the kind in the Exhibition approaches their models. Their laminated silver combinations and niello ware are themes of general admiration. The Prince of Wales paid the collection a special visit, and bestowed on it a high compliment, saying that it exhibited extraordinary progress in decorative art. In proof that he meant this he made several purchases.

The trade mottoes of some of the London associations are curious. The blacksmiths, for instance, have "By hammer and hand all arts do stand;" the distillers, "Drop as rain, distil as dew;" the founders, "God the only founder;" the inn holders, "Come, ye blessed; when I was harborless, ye lodged me;" the joiners, "Join loyalty and liberty;" the saddlers, "Hold fast, sit sure;" the weavers, "Weave truth with trust;" and the needle makers, "They sewed leaves together and made themselves aprons."

It appears, says the *Jeweler and Metalworker*, that a large quantity of supposed sapphires bought by certain manufacturers in London are nothing more than stained crystals. The story goes, that a large parcel of these stones was submitted to the Secretary of the Geological Society, who pronounced them frauds of the first water. Nevertheless, they were sold to manufacturers and mounted in expensive articles of jewelry in the belief of their genuineness. The dealers to whom they were sold, discovering the fraud, have returned them to the original manufacturers.

A fine series of antique bronzes discovered at Cagli in the beginning of April was exhibited by Signor Mochi. Among these bronzes the finest is a woman's head, a little less than life size, representing possibly a goddess. The other fragments belong to statuettes of various styles. One statuette, perhaps a Hercules, which is intact, shows on the feet traces of the process of founding, from which it may be inferred that it was never manufactured for use. This fact has induced some to believe that the bronzes here discovered indicated the site of an ancient Umbrian foundry; and what tends to confirm this view is that with the bronzes were found fragments of terra-cotta vessels, such as are used by founders. These antiquities were presented to the municipality of Cagli.

The Countess Helena Gazewska has been arrested lately at Vienna for defrauding jewelers. It has been proved already that within a comparatively short time her frauds at Paris amounted to 200,000 francs, at Marseilles to 150,000 francs, at Yverdun to 60,000 francs, at Nice to 35,000 francs, at Monaco to 20,000 francs, at Brussels to 10,000 francs, &c. The Countess disposed of the jewels thus obtained to persons in good society, whom she made believe that the jewels were her own, and that she sold them in order to help the Russian wounded.

The inventor, M. Dodé, of Paris, has just obtained a patent for covering iron with platinum. The article is brushed over with a compound consisting of 22 parts of borate of lead, and 4½ parts of cupric oxide, in oil of turpentine. Upon this the platinum, 10 parts, and ether, 5 parts, is laid, and allowed to evaporate in the air, the remainder being mixed with a gummy combination of 20 parts of borate of lead, 11 parts of red lead, and oil of lavender, 50 parts of amyb-alcohol being added to the whole. The article is then dipped into it and allowed to dry in the air, and afterwards heated to a moderate temperature.—*Jeweler and Metalworker.*

The intellectual abilities of the Japanese have been evidenced in a striking manner by a quartette of students now studying in Berlin. One of these, Dr. Dirokitao, has lately invented an ingenious optical instrument termed the leucoscope, which measures the variations in the perception of light and color by the human eye, in accordance with the strictest mathematical laws. Another, who has attained the rank of lieutenant in the Prussian army, has introduced a remarkable simplification in the mechanism of the Mauser rifle, which has succeeded the historic needle-gun. Two more who are prosecuting their chemical studies under Prof. Hofmann, have published for two years past several interesting synthetical researches on the aromatic series.

Messrs. Elkington & Co. have despatched to the Paris Exhibition a shield which has just been completed, after more than two years of diligent labor, by M. Morel-Ladeuil, the artist by whom the "Milton" shield, now at South Kensington, was produced, and who is also well known by many other specimens of *repoussée* work of the highest excellence. The "Bunyan" shield is the same size as the "Milton," and consists, like the latter, of five plates or medallions of beaten silver mounted in iron; but the shape of the plates is different from that of those in the Milton shield. The central plate represents the combat between Christian and Apollyon; and the time selected by the artist is when Christian is delivering his final blow, which secured to him the victory over his adversary. The faces of both the combatants are in the highest degree vigorous and expressive; and the accessories of the scene, the attendant fiends and angels, are introduced with great skill and judgment. At the feet of Christian is the helmet, which he lost early in the encounter, and he is repelling the last of Apollyon's darts with the shield of faith, while his right hand swings back the sword of the spirit in a pose which is full of life and earnestness. Immediately beneath this medallion, in the iron, is a figure of John Bunyan, sleeping, and much refined upon the actual representations of the worthy cobbler. The two lower medallions exhibit the Valley of the Shadow of Death, thronged with shapes hideous and horrible, among which the narrow road is seen winding; while the upper medallions represent the road to the Celestial City, passing through the "glorious company of Seraphim and Cherubim, the Elders with their golden crowns, and the Virgins with their harps." Beneath the silver bas-reliefs, and in the iron work, are escutcheons bearing devices emblematical of the three Christian virtues, faith, hope, and charity. The surfaces of iron between the medallions are further embellished with appropriate arabesques, here and there enriched by gold inlaying; but the general effect is somewhat more severe than that of the Milton shield, as befits the subject. The hammer work, taking it as a whole, is of extraordinary excellence, and the relief, in some parts, is wonderfully high and sharp, as, for example, in the wings of Apollyon and the sword of Christian.

Trade Gossip.

The centres of handsome Japanese fans are made of gold or silver.

Another find of diamonds is reported to have been discovered in Georgia.

A new design for note paper at Tiffany's has a long, thin initial at the side.

Ceylon cats' eyes, mounted with diamonds are fashionable, set as scarf pins.

The celebrated willow pattern was first made by Thomas Brosley, in 1780, in Staffordshire.

Dr. A. C. Hamlin is said to have the finest specimen of the Tourmaline in the United States.

Enamel is simply glass, and because it is colored and opaque it does not cease to be glass.

Obelisks, which are now so much sought after, were used by the Egyptians as astronomical instruments—something after the sundial order.

Durand & Co. have secured offices on the second floor of the Wheeler & Wilson Building, No. 44 East 14th Street, opposite Union Square.

The Meriden Britannia Co. are introducing many attractive designs in silver plated back combs, adorned with rich ornamentation of exquisite taste.

The *Mokame* of the Japanese, which is made by hammering bands of different metals together, is what is called by our manufacturers *laminated metal.*

A beautiful statue on exhibition at Starr's is called "Blinded by Love," and represents Cupid in the act of blindfolding a young and handsome woman.

If a quickening conscience is contagious, we hope those fraudulent Bankrupts who are disgracing the trade with their shameless rascalities will get it bad.

A factory has been established in Newark for the manufacture of Celluloid cuffs, shirt-collars, etc. This material can be cleaned like glass, with clean water.

A child's silver set at Gorham's bears the inscription "How does my lady's garden grow." The garden is represented by flowers, each flower bearing a child's tiny face.

At a regular meeting of the Executive Committee of the Jewelers' League, June 7th, thirty-six applications for membership were accepted and the parties enrolled as members.

M. K. Farnham, formerly employed by Messrs. W. B. Clapp, Young & Co., Chicago, is no longer in their employ. Drafts drawn by him on that firm will not be honored.

Malvolio, in "Twelfth-Night," says, according to Shakespeare, "I frown the while, and, perchance, wind up my watch, or play with some rich jewel." Was it a stem-winder?

The Celluloid Novelty Co. will shortly introduce some interesting novelties in Celluloid, such as bracelets, pocket-books, etc., in all the various shades which that wonderful article is susceptible of.

The Meriden Company's servers are protected by a heavy glass that reveals the workmanship and protects the silver from the inevitable scratches and dents that so soon disfigure the finest surface.

In ancient times bankers and metal-workers were identical. During the reign of George IV. Rundell & Brydge made enormous fortunes. The firm soon became Starr & Mortimer, then Mortimer & Hunt, and to-day Hunt & Roskell.

The firm of Buckenham, Cole & Hall have dissolved by mutual consent. Mr. — Saunders succeeds Mr. Hall, the retiring partner. The new firm will continue business at the old establishment under the firm name of Buckenham, Cole & Saunders.

Gus Raymond, who was arrested in Worcester, Mass., for complicity with Chas. Briggs for stealing a trunk containing $11,000 worth of jewelry belonging to Messrs. Alling Bros. & Co., of this city, has been convicted. This disposes of two more of the gang.

The late Prof. Henry was in early life a watchmaker, and ever afterward he was able to make the most delicate instruments with which to experiment. This was an advantage to him, for he was not compelled to rely upon mechanics for his machines.

The Japanese call enamel "Shipo," which signifies "the seven precious substances." These are: Songo, pink coral; Kohaku, amber; Ruri, emerald; Shako, mother-of-pearl; Meno, agate; Shinju, pearls, and Suisho, crystal. They call gold Kin and silver Gin.

The Oriental nations always had a peculiar taste for automatic figures. Under the reign of St. Louis of France, one Guillaume Boucher was employed to make automatons by the Khan of Tartary. At the death of Abdul Medjid his palace was full of automatic pieces.

The tourmaline, one of the most interesting of gems, is becoming a great favorite with the jewelers, and is highly appreciated by the amateur and mineralogist. A fine specimen of this exquisite stone may be seen at the office of the Morse Diamond Cutting Co., 192 Broadway.

The Royal Worcester porcelain works were started as self-supporting, in opposition to the Chelsea works, which depended for support on the assistance of the Duke of Cumberland. The object was to keep together a solid body of voters to secure the election of a defeated candidate for Parliament.

Frankfield & Co.'s jewelry store, No. 461 Eighth Avenue, was recently entered by burglars, who tried to force the safe containing a large quantity of valuable jewelry, diamonds, etc. They had succeeded in drilling several holes therein, but were frightened off before reaching the contents. The firm fortunately escaped with but trifling loss.

Mr. Straat, of the firm of Bathman & Straat, jewelers, will on the 19th of June, lead to the hymenial altar Miss Anna Martin, of Jersey City Heights. We have no doubt but that the happy youth has shown as good taste in the selection of a wife as he has displayed in the conduct of his business. We trust that his future troubles may be *little ones.*

Messrs. Wood & Hughes have just completed one hundred sterling silver goblets to be given as prizes at the coming Schuetzen festival at Union Hill, N. J. These goblets are elegantly designed, lined with gold, and enriched with repousse work and engraving. They are displayed in the show windows of their store at 16 John Street, and attract a great deal of attention.

Manufacturers of plated goods are apt to mark their appreciation of a good design in fine gold goods by reproducing it in plate and gilt. Messrs. Miller Bros. of this city have resolved to retaliate by establishing a separate and distinct department for the manufacture of plated goods in opposition to those who have appropriated their designs. The consequence has been a tremendous cut in the prices of plated buttons, etc.

Our old friend Oliver, of 11 John Street, had a visit from the fire fiend the other day, the consequences of which might have been worse than they were. A painter's shop underneath Mr. Oliver's store took to spontaneous combustion, and blazed up at the back of the store. Mr. Oliver's stock was slightly injured by the smoke, but business was not interrupted, and now he has settled with the Insurance Companies and is very thankful for his escape from what might have proved a serious disaster.

An interesting exhibition of hydraulic gold-mining is now in progress at the site of the Bond Street fire, where Messrs. Peer & Roberts are washing out the debris with a view to recovering the precious metals contained therein. A head of water is supplied by the Croton Acqueduct. The riffles are now in regular working order, and it seems like a scene from Dutch Run or Gold Flat transplanted to New York. Many old California miners may be seen every day inspecting the process, which reminds them of old times. We understand that Messrs. Peer & Roberts have already recovered a considerable amount of gold and silver, as well as some precious stones.

THE

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THE

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THE RECOGNIZED ORGAN OF THE TRADE.

A Monthly Journal devoted to the interests of Watchmakers, Jewelers, Silversmiths, Electro-plate Manufacturers, and those engaged in the kindred branches of art industry.

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☞ *All communications should be addressed,* D. H. HOPKINSON, *No. 42 Nassau Street, New York.*

ADVERTISING RATES MADE KNOWN ON APPLICATION.

AGENCIES, { J. H. PURDY & Co., 170 State Street, Chicago. PRATT & Co., Ninth and Arch Streets, Philadelphia. HERMAN BUSH, 14 Mytongate, Hull, England.

MESSRS. ROBBINS & APPLETON, *Holborn Circus, Hatton Garden, London, England, and* T. T. JONES & SON, *Jewelers, 330 George St,. Sydney, New South Wales, Australia, have kindly consented to receive subscriptions for this Journal.*

Will Business Revive?

IT is confidently believed in many directions that the adjournment of Congress will have a marked and immediate effect on business, although there are despondent ones among us who are hopeless of any good while the country is likely to be disturbed and worried by the ignorant bungling of Congress with the laws affecting the commercial and industrial interests. They have been told so often that we were on the verge of a return to better times, and have been so often disappointed, that they refuse to believe that the country is not going to the dogs. Up to the meeting of Congress last October, the political prophets and newspapers were promising that a few months would witness the country in as prosperous a condition as it was immediately before the war; but the promises were never fulfilled. It is certain that up to October of last year business was gradually picking up; but as soon as the policy of the new Congress came to be understood all hope of a quickened business was abandoned. Men who were getting ready to place their money in investments that promised profitable results locked it up again; enterprises that were to have been pushed were neglected; merchants were fearful of replenishing their stocks, and a general stagnation fell over the whole business world. Though the crops were wonderfully abundant trade did not improve, and labor stood idle and miserable in the streets. All this was caused by the sheer ignorance and stupidity of Congress. There was money enough waiting to be used, there were improvements waiting to be pushed to completion, labor was cheap and abundant—all the conditions were favorable to a return to that prosperity we had all sighed so long for, but it could not come then. While there was fear that our legislators were intent upon confusing matters generally nothing could be done. Perhaps now, when the power to inflict further damage on the country has almost passed from the hands of the present Congress, the long looked for revival may appear. The country has it in its power to prevent the distrust that has so agitated and paralyzed business for the last two years. If a Congress is elected pledged to abstain from interference with the financial or revenue laws, there will be little danger that the members of the present body will dare attempt to put any more of their mischievous measures into effect. Therefore, if the present depression is to continue, the people alone will be to blame. It is universally conceded that the worst phases of the commercial reaction have passed. Capital is waiting for employment and labor for work. Prices have reached a normal position; the crops of the country are extraordinarily large; our exports are daily increasing, and there is no natural reason why the country should not begin to immediately reap the benefit of the advantages surrounding it. The weak, insecure and dishonest corporations that thrived in a speculative time have all been wiped out; we are on a healthy and firm foundation, and recovery from the position in which we have lain so long seems to be the most natural thing in the world.

Fraudulent Bankrupts.

WE are in receipt of numerous letters from retail dealers earnestly protesting against the practice, so largely indulged in by manufacturers and jobbers, of compromising with insolvent creditors, and reinstating them in business. This practice works great injury to the retailer who proposes to pay his debts, dollar for dollar, and forces him into a ruinous competition with unscrupulous men who do not expect to pay anything, or, at best, but a small percentage of their indebtedness. No doubt there have been many honest failures in the jewelry business, the unfortunate bankrupts being entitled to the sympathy and continued confidence of their creditors. But the number of these, compared to the dishonest failures, is very small. What chance has an honest debtor to compete in business with one whose chief ambition is to force his goods on the public at any price, expecting to compromise with the manufacturers and jobbers at 15 or 20 cents on the dollar, get a new stock and repeat the operation? His chances for success are about as good as they would be if he were competing with a burglar who had opened a jewelry store with a "jimmy," and was hastily disposing of the goods before he should be found out. This practice of compromising with insolvents, and giving them a new stock of goods on credit is working sad havoc with the honest retailers, many of whom have been driven into a corner by the unexpected and dishonest competition they have been forced to contend against. There is scarcely a town in the country that has not had its "bankrupt sales," whereby large stocks of goods have been worked off to the great damage of the local dealers. The bankrupt, who settles for 20 cents on the dollar, and is immediately set up in business again by his confiding creditors, is the only one who reaps a profit on these transactions. All others who have dealings with him, or are forced to compete with him, are numbered with his victims. The recklessness with which these unscrupulous retailers carry on their business is only equalled by the recklessness shown by the manufacturers in restocking them and sending them out to undermine the trade of honest dealers. When rogues are thus paid a premium for their rascality, what possible encouragement is

there for men to be honest? They see themselves sacrificed at every turn, and the dishonest insolvent rioting in his dishonor by the direct encouragement of the very men whom he has robbed.

We have vigorously protested against this suicidal policy heretofore, and are glad to know that our protest has borne some good fruit. In quite a number of instances dishonest insolvents have been successfully overhauled by the trade, and finally driven from the business. But there is still altogether too much leniency shown, as is indicated by the numerous complaints we have recently received. We are assured that a number of so-called insolvents who are now offering 20 and 25 cents to compromise their indebtedness, are abundantly able to pay dollar for dollar, if they would only turn over to their creditors the property they have sequestrated. Some better plan for arriving at an exact knowledge of the standing of insolvents than that now in vogue should be established. A thorough investigation of every case should be made with a view to driving out of the business all those who are dishonestly inclined. We are glad to learn that the honest retailers are taking this matter in hand for their own protection. An association is being formed, one of the rules of which binds the members not to purchase further from those manufacturers who compromise with dishonest insolvent debtors, and then set them up in business again by selling them goods on credit. We have been asked to print the schedules of indebtedness and lists of assets of bankrupts, together with their terms of settlement, to the end that their competitors may take measures to protect themselves in the future. We have in our possession the names of over seventy dealers who are in full sympathy with this movement, and who will make their influence felt by the manufacturers and jobbers who have made possible the dishonest practices against which we have so loudly protested. We are glad to see that the trade has awakened to a just appreciation of the immense injury to legitimate trade which this practice of compromising is doing, and we will do all in our power to render their efforts to correct the evil successful. Our columns are open to them at any time for the furtherance of the proposed reform.

A Much Needed Reform.

A NUMBER of prominent and influential houses in the trade are making efforts to establish a more uniform and satisfactory system of doing business. At present the credit system which prevails in the trade is conducted on a basis so loose as to jeopardize the best interests of both debtor and creditor, by encouraging carelessness in the settlement of accounts. Manufacturers and jobbers have so encouraged reckless buying that retailers have been induced to buy beyond their necessities, and, consequently, to incur indebtedness without having a fair prospect of liquidating it at the specified time. Then come extensions after extensions, and the buyer is embarrassed with a superfluous stock of goods as well as obligations which he cannot meet, while the seller finds that his list of maturing accounts is not to be relied upon as a means for meeting his own obligations. As a remedy for this unsatisfactory condition of trade, it is proposed that all accounts, when the cash discount is not taken advantage of, shall be settled by notes when statements are rendered. The idea is an excellent one, and, if carried out, will tend to make buyers more cautious. Business men are more punctilious regarding their "bills payable" than they are regarding book accounts that may be running against them. If a man has a note due at a specified time, and the fact is presented to his eyes every time he looks over his accounts, he will use every effort to meet it. A past-due note is a much more formidable object for a business man to contemplate than an overdue book account, which may not have been satisfactorily adjusted. A statement of account is easily overlooked, while to neglect to provide for a maturing note is apt to trouble the conscience of an honestly inclined business man. There are any number of dealers who have gone on ordering goods year after year, without having a clear and definite idea of how their business affairs stand. They go on recklessly or carelessly buying and selling, drawing out money from the business for their living and other expenses, without really knowing whether their business is profitable or not, or whether their assets are equal to their liabilities. There has been a looseness in the jewelry business in this respect which is not to be found in any other, and for which both buyers and sellers are responsible. The reform proposed will by no means curtail the business facilities heretofore extended to the trade, but it will introduce a better system into the credit phases of them. When a man orders a bill of goods he will have the customary credit extended to him—two, three or four months—but instead of having a book account against him, he will be required to give his note, without interest, on presentation of the statement of his indebtedness. Should it become necessary for him to have more time, he will be able to get it by giving a new note, bearing interest at seven per cent. If he asks for this further extension, he cannot, certainly, object to paying the lawful interest to which his creditor is as much entitled, after the maturing of the first note, as he would be if he had made a cash loan of the same amount. It is not the intention to lop off any of the courtesies or facilities now offered to dealers, but simply to get the trade upon a better business footing if possible, whereby both buyer and seller will be able more readily to see the exact condition of their business affairs. This note system, if generally carried out, will enable a dealer to see at a glance the amount of his maturing obligations, and to make such provision for them as may be in his power. It will keep constantly before his mind his responsibility as a business man, and tend to make him more careful and circumspect in his transactions, to avoid extravagance, and to substitute care and watchfulness for recklessness and inattention. Many failures can be traced directly to the fact that the dealers did not know the true condition of their affairs. They had gone on running up accounts, accumulating unsalable goods that some one wanted to get rid of, and living beyond what they could really afford, when hard times were pressing and business was falling away from them. Had their obligations been in the nature of outstanding notes, they would have had a better knowledge of their business and a keener appreciation of their responsibilities. The proposed change is heartily approved by leading manufacturers and jobbers, and is likely to become a general feature of the trade at an early day.

Refreshing Impudence.

THE impudence of some dealers passeth all understanding. They seem to think that their creditors have no rights whatever that they are bound to respect. They are suave and truckling when asking for credit, but when once they have obtained the coveted goods, their sense of obligations conferred suddenly becomes dim and obscure. Away from their creditors, and with the goods in their possession, they transgress every principle of business and commercial courtesy with the most provoking indifference. A case in point was related to us a few days since. A Western dealer, who does business not a thousand miles from Chicago, permitted an overdue account to stand without offering a word in explanation. A statement was forwarded with the usual request for a remittance, but no answer was returned to frequent communications. He was then notified that the party would draw on him for the amount. To this the debtor replied that he was much annoyed at the persistence with which the creditor had urged his claim; that if he drew upon him he should pay no attention to the draft; and threatened that if such a draft was made, the debtor would withdraw his patronage from such an importuning creditor! Impudence could scarcely go further. Yet this, we are assured, is only one out of many similar cases. It is surprising the utter indifference which some debtors can assume. They trample under foot all business usages, ignore their promises, and assume to be indignant if the man who has conferred favors upon them ventures to claim what is honestly his due. Such abuses of confidence tend to bring the entire trade into disrepute, and the sooner the trade refuse to deal with men of this stamp the better it will be. Yet the manu-

facturers and jobbers are largely to blame for the reckless indifference which debtors of this class manifest regarding their obligations. They have been so anxious to dispose of their goods that they have given credit to almost any one who asked for it, have given extension after extension on overdue paper, giving additional credits without payment of old accounts, and have made the debtors feel as if they were conferring a favor by taking the goods so ostentatiously forced upon them. There can be no safety in business transacted in this way, and it is not at all to be wondered at that debtors become impudent and reckless, and finally wind up with a compromise of their indebtedness at 15 or 20 cents on the dollar. Recklessness at one end of the line is sure to breed corresponding recklessness at the other end.

A CORRESPONDENT writes to inform us of a practice in which certain manufacturers indulge, which can be denominated as little short of downright robbery. This is the borrowing of samples of new styles of goods and copying them. For instance, a clerk rushes into a neighbor's establishment and wants to borrow a set of jewelry, latest pattern, or a new style of pin or ring, asserting that they have a special customer in the store to whom they can make a sale. Some plausible excuse is given for not selling their own goods, and the coveted articles are carried away. Instead of being sold to a customer, they are hurried to the factory, where they are at once copied, and speedily reproduced, probably in an inferior grade of gold, so that the original getter-up of the design can be undersold. Our correspondent complains of having been victimized by this "confidence game" on several occasions by manufacturers whom he supposed were possessed of sufficient originality to get up their own designs. We should regard such a transaction as wholly unworthy of honorable business men, and we are confident that it is not a common practice. There are, however, a few men in the business who are capable of almost any meanness, and if goods were loaned them, the lender should not be surprised to see them copied, but should be thankful if he obtains the originals back again. We know of no way in which the originality of designs can be protected. Some might be patented, but taking out a patent is like buying into a lawsuit, it is not good for anything until it has been passed upon by the courts. A copy-right is equally impotent to protect, and the only way left seems to be to make goods so superior that others cannot afford to steal the designs.

THE trade has at last succeeded in creating "The Jewelers' Protective Association," which has for its object mutual protection in case of the robbery of any merchandise while in the custody of any of its members, or their salesmen, and the employment of suitable means to prosecute the thieves and procure the recovery of the property. The society already includes the principal members of the trade in this and other cities, who are determined to wage active and unceasing warfare against the organized gang of robbers who have for so long preyed on commercial travelers. Ample means have been provided to place the organization on a substantial basis, and the following officials have already been elected:

W. R. Alling, of Alling Bros. & Co., President; Ira Goddard, Secretary and Treasurer; L. A. Parsons, of Wheeler, Parsons & Hayes; Thos. Slater, of Enos Richardson & Co.; S. Oppenheimer, of Oppenheimer Bros. & Veith; W. Smith, of W. Smith & Co., and J. M. Miller, of Miller Bros., Executive Committee.

WE have received information that two swindlers are travelling through the north of England representing themselves as agents of the American Watch Company. They travel with two gaudily painted vans—like circus band wagons—and are accompanied by two boys. Arriving in a town they open their vans and display a lot of cheap and worthless watches, made in imitation of American watches, and, announcing themselves as agents for the American Watch Company, proceed to sell their trash by auction. They have made their appearance in several places already, and are probably still on the move. Our correspondent says the vans appear to be of American manufacture, and are excellent, but the watches are a fraud in every particular. The American Watch Company has taken steps to prevent these petty rascals from further imposing upon the public. As they have no legal remedy, all they can do is to denounce the swindlers in each town they visit. It is hoped this process will soon drive them out of their nefarious business.

THERE have during the past month been several meetings of the prominent manufacturers of silver-plated hollow ware to consider the condition of the trade, and to devise a more uniform system of conducting business. Great demoralization has for some time existed from lack of a general understanding, which has been ruinous to the legitimate trade. As a result of the recent convention of manufacturers a circular has been issued announcing their conclusions and fixing the discounts as follows, viz.: on silver plated hollow ware, 40 per cent., four months note for approved credit, or a cash discount of 5 per cent. if the same is paid within 30 days from the average date of invoice; to purchasers to the value of $500 net in a season a rebate of 5 per cent. will be allowed; to purchasers of $1,000 net a rebate of 10 per cent. will be allowed. The trade are also notified that henceforth goods will not be consigned or left on sale, and no goods will be exchanged or taken back. It is believed that this rule, strictly enforced, will break up the evils of auction sales of shop-worn goods, and of interior jobbers giving full discounts to those outside the legitimate trade, and other similar irregularities. The circular is signed by the Meriden Britannia Co., the Middletown Plate Co., Simpson, Hall, Miller & Co., Rogers & Bro., Hall, Elton & Co., Reed & Barton, the Wilcox Silver Plate Co., Rogers, Smith & Co., the Meriden Silver Plate Co. and the Derby Silver Co.

Foreign Notes.

THE GOLD STANDARD.—A Select Committee of the House of Commons has been appointed, on the motion of Sir Henry Jackson, to inquire into the operation of the Act relating to the Hall marking of gold and silver manufactures. It has long been felt that there are substantial grievances connected with this subject. Gold, as is well known, is never used in its pure state in the manufacture of jewelry or plate. There are four standards, varying from the traditional eighteen-carat to the seldom-confessed six, the latter being the basis of nearly all that is sold as "French jewelry." The proposal now to be sifted through the criticisms of a Select Committee is to establish a finer test than any at present existing, and so to reinstate, as it were, the character of "English gold"—raising it, in fact, to a level with the Imperial coinage.

An American merchant in Paris has issued a small blue book of fourteen pages on "Three works of Art," manufactured in San Francisco expressly for the International Exhibition. The first is "a massive and elegant porte-monnaie and card-case," made of gold and quartz from the mines of two States and two Territories. The second is a ladies' powder-box and puff, surmounted by a grizzly bear in the act of crossing a great overland railway. The third is a jewel casket, "representing the substantial mines of the Pacific coast." On the cover is "a pictorial and historical representation of a buffalo hunt on the plains," with big trees and a railroad track with two bulls dashing across it to evade the hunters who are in close pursuit. The casket contains nearly nineteen pounds of solid gold and auriferous quartz, and with the other pieces is valued at $30,000. The case is made of different species of wood grown on the Pacific coast.

The pearl-fishing season off the north-west coast of West Australia is reported to have been very successful, and a great impetus has been given to the industry by the high prices prevailing in the English markets for pearls and nacre, or mother-of-pearl. Operations are now conducted along a much greater extent of shore than was formerly the case, and some good takes of pearls have been made on new grounds. The facility with which pearling grounds may be fished out suggests the desirability of similar steps being taken here to those already adopted in Ceylon, to check over-fishing and prevent the exhaustion of the beds. The pearl mussel, it is now known, is in its prime for only a comparatively short period of its existence. If taken too young great difficulty attends the work, and the pearls are small in size and poor in quality. If allowed, on the other hand, to remain too long on the beds, the mussels are easily washed away by currents, storms, or tidal influences, and the produce is therefore lost. It is believed that at about five years of age the mussel is in the best condition to be taken, and it is necessary for careful observations and experimental fishings to be continually made in order to ascertain when a bed is in fit condition for the divers to work upon it. The experience of Ceylon should act as a warning in due time to the authorities of Western Australia, or an industry which is now attaining important dimensions may be suddenly and perhaps irretrievably lost.

Electro Gilding and Silvering

Of watch movements, or parts thereof, by a single and constant cell of battery.

BY P. H. MARTENS, FREIBURG IN BADEN.

IN order to give the various parts of watch movements a pleasing appearance, and to protect them at the same time durably from tarnishing, manufacturers invariably used to fire-gild them. Yet the manipulation of this kind of gilding is not only circumstantial, but to a great extent dangerous, as the process can only be done by the evaporation of mercury, the fumes of which greatly affect the nervous system, and are even poisonous, and has besides the disadvantage of sottening the metal to be gilded, as the application of a certain degree of heat is indispensable to effect the fire-gilding.

When in the year 1840, M. de la Rive, a chemist in Geneve, Switzerland, discovered a method to cover metallic articles with a thin coat of gold or silver in a wet way, by a galvanic battery, the same was looked upon in the beginning with suspicion, and the durability of this kind of gilding, as well as the application of the method greatly doubted, in reason of the undeveloped state of treatment and the use of impure or even wrong chemicals at the time of discovery; it did, however, not take long before all these drawbacks were successfully overcome, and by Dr. L. Elsner, in Berlin, and other eminent metallurgical chemists, most conclusively proved that this kind of gilding was not only equally durable, but far superior in color, less dangerous, and considerably less expensive than the old method of fire-gilding. Without entering into the history of discovery and rapid development of this sort of gilding, I will attempt to explain the method and success I gained by my own experience in the gilding and silvering by the electro process, and also the most economical and yet efficiently practical contrivances in connection therewith, to enable watchmakers and others, who may in pursuit of their trade have occasion to make use of it, to do it in an easy way, and without the trouble of making experiments, which very often result in disappointment.

All parts of watch movements made of brass are, with rare exceptions, gilded in a bright frosty appearance. In order to obtain the required frosting, it is necessary to silver the parts previous to gilding them, and to make them more susceptible to receive the silvering, they are, after being well stoned, polished and cleaned, dipped for a moment in a solution of

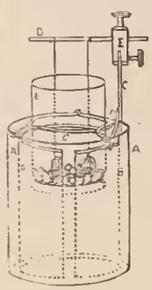
25 parts oil of vitriol (commercial
25 " nitric acid " and
3 " common salt,

and immediately after removing, rinsed in rain water. To be sure you have freed all parts to be dipped from grease, it is advisable to brush the articles with carbonate of soda and water before dipping. The dipping in the above-mentioned solution produces a thoroughly clean and also somewhat porous surface, and prepares them for the proper receiving and adhering of the silvering. The dipping requires great care with articles very small or thin, as the acid weakens them if left therein too long. After the articles have assumed a clean and even surface, they are then silvered in the following way: Take

24 parts of common salt
6 " cremor tartari (cream of tartar)
1 " silvering powder (the making is described below),

and put all in a porcelain basin, add to it as much rain or distilled water as to make into the consistency of thin cream and mix well, then take a small short-haired stiff brush, which ought to be soaked before using for several hours in salt water, to free it from any grease, and at the same time to soften it; the brush is then dipped in the mixture and applied to the articles, which are fastened with pins to a flat piece of cork and gently brushed. This will produce the desired frosting; it requires care not to apply too much of the mixture to begin with, as by doing so an unequal coat of silver would be deposited, which may cause a part to peel off. The articles are then removed from the cork and brushed with carbonate of soda and water, and well rinsed, after which they are scratch-brushed in soap-water, until the frosting becomes bright. The scratch-brush to be used for this purpose ought to be annealed on a charcoal fire before using it, to enable the operator to bend the ends of the brush, after being cut open, in a straight way. The open end should occasionally be rubbed on a grater (a nutmeg-grater will admirably answer the purpose), and then cut even with a pair of scissors. The soap-water may be prepared by putting some soap ley (to be had in soapworks), for a few hours in water before using it; the ley is then removed and dried in the sun, or on a stove, to save it from spoiling, and to preserve it for future use. The water itself will keep for a time, if kept in a covered vessel. After the silver frosting has turned out to satisfaction, the articles are well rinsed in rain or distilled water, and are then fully prepared to receive the gilding by the following process:

The apparatus consists of a single cell, as shown in the annexed cut, and is composed of (A) a glass vessel of 3 by 4 inches diameter, and 7 by 9 inches high. (B) an amalgamated zinc plate (the amalgamation of the zinc plate is attained by immersing the plate in diluted sulphuric acid, in order to get it thoroughly clean, and then brushed or rubbed with a cloth all over evenly with mercury), of ⅛ by ¼ inch in thickness, bent in the shape of an open cylinder, on to which



is soldered in an upright manner, a copper wire, C. On the upper end of this copper wire is fastened a double screwtap E. This holds the horizontal arm D, on which the parts to be gilded are suspended; F is a glass cylinder of about 1½ by 2½ inches in diameter, and 2 by 3 inches long, which is held by the three-armed holder G, to the requisite height. The lower end of the glass cylinder F, which has a small flap, is closed up with a piece of bladder tied tightly round the flap; it is well to soften the piece of bladder by soaking it in water before tying it on; this will make it fully pliable, and will enable the cylinder to hold liquid without allowing it to escape. In this cylinder F, the gold solution (the preparations of which I will further on fully describe) is poured, and the glass vessel A holding the zinc cylinder B, is filled with a saturated solution of common salt, and the solutions in both glass vessels so regulated that they form as near as possible an equal surface which will be observed by the transparency of the glass. This is necessary to prevent a pressure from underneath the cylinder holding the gold solutions. The parts to be gilded are then suspended on thin copper wires on the arm D into the gold solution, so that they are fully immersed. By a middling temperature of 13 to 16 degrees Reaumer, it will be observed that the immersed articles assume a yellow color in a few minutes, and after the articles have been kept in the solution from fifteen to twenty minutes, it is well to remove them in order to scratch-brush with the soap solution until they appear bright. They are then well rinsed and again suspended for fifteen or twenty minutes in the gold solution, when they will have received a coating of gold sufficiently strong for the purpose required. If the solution is newly made, two immersions are quite sufficient to obtain the desired thickness of gilding, yet when the solution has been weakened by frequent uses, a succession of immersions will be necessary to obtain the desired coating. After this, it is again requisite to scratch-brush the gilt articles in soap water, but a very fine and soft scratch-brush ought to be used for this purpose, and the scratch-brushing to be gently applied until the gilding is assuming an all-over equally bright surface. The gilded articles are then dipped first in clean water and then in spirits of wine, and dried in fine sawdust. Should, after observing and carrying out of all the above mentioned directions, small scratches be visible on the surface of the gilt articles, then there is no other way to remove such scratches than by again immersing the articles in the gold bath and rescratch-brushing them very carefully. Through careless scratch-brushing or want of cleanliness in the operation, these scratches are produced on the surface of the frosted gilt articles, and it is absolutely necessary to bestow every attention to this part of the operation in order to obtain a faultless frosted gilding.

Proceedings of the Horological Club.

A Distinguished Body of Watch and Clock Makers.

Fifty-second Discussion.—Communicated by the Secretary.

CUTTING WHEELS WITH UNUSUAL NUMBERS OF TEETH.

Secretary of the Horological Club:

It is often hard to find ready made wheels containing uneven numbers of teeth; for instance, English fuzee wheels, say with 65 teeth. There are many other numbers of teeth utterly impossible to cut on the dividing machine, even by a division of a duplicate number to the number of teeth required. To obviate this difficulty I practice in the following manner. Say I want a wheel containing 77 teeth of a given size,—a very odd number, but extremes serve best for illustration. Cutting a wheel No. 2, of the same given size as No. 1, into 76 parts or teeth, I attach No. 2 firmly to the holder spring blade of the division board; in most engines it is practicable behind the screw; also, a small spring laying firmly between the divisions of the attached wheel No. 2, so arranged as to permit lifting it up far enough to let the teeth pass without changing its direction in any way. I proceed to make the first incision into wheel No. 1, already fastened in the stock or spindle. Then, lifting the spring holder on the division plate, turning the plate to the next point for the second incision or division of the first tooth, before starting to cut the same, I lift up the little spring from between the teeth of wheel No. 2, and turn the wheel as well as the screw far enough back to let the little spring fall nto the next division of the teeth. Having thus diminished by 1-76 part the distance between the first and second incisions, I proceed in the same manner with the second and third teeth. Thus cutting off 1-76 part of each distance between the teeth before the circuit of the wheel is complete, I save 76x76=5,776 parts; add 76 of the last division, =5,852; divide by 76, leaves a quotient of 77, or as many equal divisions as there are teeth.

Asking your co-operation in behalf of our noble Editor and his work preservative of all works, we are only rendering homage to whom honor is due. From a careful perusal of its manifold information, who can estimate the worth of it to the youths of our trade who are learning from its columns, in luxurious ease, enjoying all the advantages of the old and experienced masters, which the apprentices of old had to wait and weary many years, until it pleased his decrepit tyrant of a master to disclose little by little those finishing strokes and trade tricks appertaining to and expected of a workman. Five, six, and even seven years of servitude were exacted of the boy, before he could leave "Eulenspiegel's" dreaded lot and advance to the more important role of a journeyman. Thanks to the efforts of our Editor, the trade of the new Continent is surrendering the prestiges of the old world, tracing its history in indelible lines. From the past we learn to appreciate the present, and so judge the future. As a real repertory of gratuitous knowledge to all, the members of the trade, young and old, ought to herald thankfully the monthly appearance of the Jewelers' Circular. Chas. Hofer.

Mr. McFuzee thanked Mr. Hofer for the very ingenious way of surmounting the difficulty spoken of. It was of course capable of being much extended, and applied to a great variety of cases, as would readily be seen by the workman. It is just such "wrinkles," trade secrets and tricks that we are all after. Circumstances lead one person to study out a short cut in one direction, others would do so in other directions, and each would be benefitted by knowing the discoveries of the others, with no loss to any one. If we could only induce every one, and especially the veterans of the trade, to write out for the Club these valuable items, what an amount of time, labor and patience would be saved by us all! Let no one hesitate to send in such practical bits of information that he has. Even if familiar to some of our readers, it will be new and welcome to a much greater number of others. By all means send them in.

As to the latter part of Mr. Hofer's letter, we can assure him that we of the Club appreciate the liberality of our Editor. To him is due not only the beginning, but the continued existence and prosperity of this honorable body. The spacious and elegant council chamber in which our meetings are held, with all its luxurious appointments for our convenience, besides frequent and generous contributions towards the various wants of our association when engaged in its arduous labors, and, last but not least, the free publication of our proceedings to the world, all attest his liberality in promoting the interests of the craft at home. His services to the trade at large are known to all readers of their representative paper, the Circular, filled monthly with valuable articles from the best writers. What do we not owe him for securing the pen of Excelsior, who for nearly four years has not failed to give us each month a number of his clear, pains-taking and useful "Practical Hint on Watch Repairing?" Nowhere else can any such series of articles be found, either as to the particular information they convey, or in the way of conveying it, so as to be comprehensible and serviceable to every intelligent workman. Look also at the numerous other valuable original articles, from experts in the different branches, to be found in the broad pages of the Circular, which is no less commendable for its handsome appearance and get up than for the worth of its matter. Its abundant and increasing prosperity proves that the trade appreciate *their journal*, and its readers must heartily rejoice at it, and hope that it may continue to increase till every shop and every workman shall become a recipient of its regular visitations, with all the benefits to be derived from its varied and ever valuable contents. We would also suggest that every reader show his approval in a practical manner, by bringing it to the notice of his fellow workmen, and inducing them to send in their subscriptions. Whatever will elevate the trade is a benefit to each individual member thereof. That we believe to be the only practical way of rooting out the botches, and surely nothing can be better adapted for such elevation and improvement than the regular perusal and study of a good trade journal.

PRICES OF WATCH WORK.

Secretary of Horological Club:

I notice there is considerable interest felt in the matter of cutting prices on watch work, and hoping it will not be out of place I will tell you what is being done in Watertown in regard to that evil. There are four shops here. Of late times became harder and work more scarce, consequently the danger of cutting prices became more imminent. We therefore prepared a price list of work most likely to be called for, and all signed it, and had a number neatly printed, and each one of us now has one hanging up in a conspicuous place. The result is that all are adhering to what they agreed to, which cultivates a good feeling towards each other. And now as the price of work is established, every one is striving to outdo his neighbor in the *quality* of his work, hoping thereby to get the most to do, which is certainly a great benefit to the customer and workman. I assure you the plan works well here. However, I disagree with your correspondent Amaltheia in regard to a general list gotten up in New York. The list should, in my opinion, be gotten up in the town where the work is done. C. W. C.

Mr. Clerkenwell commended this as an honorable, straightforward, manly way of doing, and one sure to work well where there were honorable, straightforward and manly jewelers. But when the jewelers of a town belonged to the tricky, underhanded and unreliable sort, as he was sorry to believe they did in some places, its operation would not be satisfactory,—nor, in all probability, would any other plan. He thought, however, that the best way, even in such places, would be for those who considered themselves gentlemen and men of honor to unite on the above or some similar plan, and leave the tricksters to their own devices, whatever they might be. If honest men could not succeed in business by following an honest system, he thought it doubtful if they would improve their chances much by descending to trickery,—and they ought not to, if they could.

DEFECTIVE WHEEL AND PALLET LOCKINGS.

Secretary Horological Club:

Without wishing to enter into any controversy with regard to the communication of H. P. B. in your June number of the Jewelers' Circular, on the safety of the lock in the escapement of the Waltham, Elgin, and E. Howard & Co.'s watches, I would like to say a few words on the subject, as I think his remarks would tend to mislead any one not familiar with escapements, particularly those manufactured by the above named companies, and in fact prejudice purchasers against American watches.

While granting that all escapements should be made *safe*, it is by no means necessary that the lockings should be *so deep* that a large portion of the power is taken up in unlocking, and thus make it

necessary that a much stronger spring be used than is actually needed in running the watch, or else dragging down the motion on the last part of the spring. As I understand it, Grossmann and all other good escapement makers agree in one thing, viz.: that an escapement should be so laid out and arranged as to give it as light a lock as possible and have it safe. Now what constitutes "safety?" Certainly not that the tooth of the wheel should lock one-half of its length on the locking face of the pallet arm, and thus take up so much of the power to unlock or release it. The "safety" depends on its being so constructed that, when the tooth drops from one arm of the pallet, the other arm should be so far within the outer circle of the wheel that the next tooth will be *sure* to strike on the *locking face*, and not allow it to strike on the *impulse angle*. The banking should then be so adjusted as to give a little slide or freedom of motion on the stone, and this need be but *very* little,—say just enough to take up or allow for the side shake of the pivots. With this arrangement, there need be no fear of the "safety" of the escapement, unless some other trouble exists. Of course, with a fine locking escapement, every other part must be accurate; and the roller action must be finely adjusted. In an experience of nearly twenty years in handling American watches, I have found but few instances such as H. P. B. mentions, and in those cases they were the *exceptions* rather than the *rule*, and were immediately rectified on sending them to the manufacturers. EXPERT.

Mr. Uhrmacher said that this communication was from a gentleman who was indeed an expert and an authority on such subjects. Mr. H. P. B. would see that Expert fully agreed with Grossmann and Excelsior in their directions for the depth of the locking, etc., which he believed was put at $1\frac{1}{2}°$ to $2\frac{1}{2}°$. This was a very small amount, when measured on so short a piece as watch pallets, and one would need to be very careful in testing, as any trembling or backward motion of the hand at the end of the "lift" would prevent the lever from locking. The depthing would then appear to be scant, when the trouble was really in the faulty manipulation of the workman in testing it. If any one had an escapement that he thought defective, it would be better to try it in the angle-meter, which would show exactly the depth of the locking, etc. When thus tested, he thought, with Expert, that such a defect would be very rare in the fine or even medium grade watches of the above companies.

NEW CONSTRUCTION OF DUPLEX WATCH.—THE ANGLE METER, ETC.

To Excelsior:

I have a duplex watch of peculiar construction: the fourth wheel contains 60 teeth, with 8 leaf pinion as usual; this meshes into a pinion of ten leaves, carrying a forty tooth wheel, which meshes into the escape wheel pinion, which has 8 leaves. The escape wheel has 4 teeth only, with impulse tooth midway. It has a long pivot which carries hand on dial, where seconds hand dial usually is. The long seconds hand traversing dial beats $\frac{1}{2}$ seconds, which would cause the short hand to beat 1-15 of a second each time, would it not?

Now I wish to ask if the same rule will apply in this case in selecting a roller jewel as will apply in selecting roller for any 15 tooth wheel, as per "Practical Hints." Perhaps I have gone more into details than was necessary, but thought it best to do so.

I wish further to ask if the construction of the angle-meter has ever been described in the CIRCULAR, and if it is likely to come into general use, and are they to be procured at the present time?

C. S. C.

Mr. Isochronal, who is "Excelsior's proxy in the Club, to answer letters which Excelsior finds it impossible, from lack of time, to attend to himself, responded that as the beat is made by the escape wheel, of course it is that which *beats* half-seconds, although the center seconds hand on the fourth wheel shows half-seconds on the large dial circle. The hand on the escape pinion would beat and show half-seconds, and its dial should have four divisions, so that the hand would make a revolution in two seconds.

As to the roller jewel, the same rule would of course *not* apply as to a 15-tooth wheel, for this turns say three times as fast as the latter, and consequently has three times less force, with the same power of mainspring. According to Excelsior, the diameter of the roller should be such that the friction of the repose tooth upon it shall nullify slight inequalities in the motive power, etc., sufficiently for all ordinary purposes. If the roller is larger than that proportion, we have all the injurious effects of excessive friction in the escapement. If smaller, then the frictions are less and the balance more free, and the effects of change of positions, motive power, temperature, or want of isochronism in the hair-spring become more prominent and troublesome. The size given in Excelsior's rules is that medium which experience has shown to produce the best results in practice. The roller of this watch, consequently, in order to properly exert this function of "control," must be less than $\frac{1}{3}$ the size of the ordinary roller. But as that is impossible to make, it would be necessary to make it as small as is safe, and supply the "control" in some other manner, viz.: by the use of the chain and fuzee for equalizing the motive force, and by also perfecting the adjustments of the hair-spring for isochronism, of the pivots for positions, and of the balance for temperature. The proposed change in the construction is therefore attended with great drawbacks, (some of them not mentioned above, with no corresponding advantages.

The construction of the angle-meter was described in sections (438) to (440). It is not on the market, and Excelsior recommends every workman to make one for himself. We know that many have already done this, and many more would do so if they knew the usefulness of this tool.

RATING CARD FOR WATCHES.

Secretary of Horological Club:

I enclose a rating card we give to our customers, when we deliver their watches after repairs. On one side it is our ordinary business card. On the back it is arranged as shown below, which I have filled up for illustration. First is the date, June 28, '78. Next is the name of owner, with description of the watch, "silver open-face lever, made by Taylor, No. 117,181," or any way to connect the card with the watch. The first entry is when it was set with the regulator on delivery to the customer, June 28, 10.15 A. M. The next is when it was brought in to regulate, June 31, 3.40 P. M., when it was found one minute and two seconds slow. "Slow" is indicated by the minus mark, (—), and fast by plus, (+). A. M. is indicated by an inverted V, (∧), between the hour and minute. The last column tells what was done, the *O* indicates that it was set; and an L means that the watch was both regulated and set. When no mark was made, nothing was done, as was the case at the last entry, when the error was only one second fast. We find this very convenient for fine watches, when we want to be sure how long it has run, also how it has done previously. I also enclose a price list of watch-work followed by the jewelers of Brattleboro. C. A. T.

When Put in Order. 6-27-78.

JOHN SMITH,

Sil. O. F. Lever, Taylor, 117,181.

Month.	D'y	Hr.	'	'	"	— +
June	28	10 V	15			
"	31	3	40	1	2	— L
July	4	9 ∧	30		10	+ O
"	6	5	00		12	+ L
"	8	5	15		1	+

Mr. Uhrmacher observed that every workman must have noticed the need of some better way than to depend on the memory of the customer. It was quite necessary to know how long it had run to make the loss or gain, before we could move the regulator the right amount. The finer the watch the more the necessity for being particular about this, and watchmakers would find such a card very useful. The price list of work appeared to be well adapted for a good sized country town, being very reasonable, while at the same time enough to justify doing a thoroughly good job.

GUTMANN'S AUTOMATIC HAMMER AND PUNCH.

Mr. Gutmann's ingenious tool was then handed around for inspection, and appeared to be a very handy device for light work, when both hands were engaged. The punch is placed on the work, the forefinger through the ring at the top, which with the third finger

holds the tool, while the ring around it is turned by the thumb and second finger. On the interior of this ring are three inclined planes, which by the revolution of the ring raise a pin connected with the plunger or hammer inside. When the pin has reached the top of the incline or cam, it slips off down the other side, which is vertical, and the hammer is projected by a spiral spring down against the top of the punch, giving quite a blow to it. It would seem as if there must be frequent opportunities for its use on the work bench. It is to be had of material jobbers, or will be sent by mail postpaid by the patentee and manufacturer, whose card appears on another page.

REMOVING DUPLEX HANDS.—CUTTING THE RIM OF EXPANSION-SHAPE BALANCE.

Secretary Horological Club:

What is the best way to remove the minute hand without marring the hour hand? I find that in using cutting pliers where the minute hand is driven on very tight, it is almost impossible to remove it without marring one or the other.

I see in the last number of CIRCULAR G. A. H. makes inquiry in regard to feasibility of cutting balance rim of imitation expansion balance. Will Mr. Horologer, who answered the inquiry, explain a little in regard to the adjustment he speaks of? C. S. C.

Mr. Horologer said that the better way, in the case mentioned, would be to take off *both* of the hands at once, by inserting the pliers under the hour hand. But hands should never be put on so tight as to present any difficulty in getting them off, not only because the pressure was liable to make the sockets of the wheels bind and stick, but in turning one of them to make them point correctly, there was danger of binding or breaking teeth off the wheels before it would move. Always free them up a little before replacing.

The adjustment spoken of was the adjustment for temperatures, more generally termed the adjustment to heat and cold. The object of having a balance made of two metals, as in the usual "expansion balance" was to utilize their different action under the influence of changes of temperature, in such a way as to prevent those changes affecting the time of the watch, as would be the case with a plain balance, or an "expansion-shaped" balance. To do this, the rim must be cut in a certain way, and the screws moved in one direction or the other, as indicated by trials of the watch in the adjusting-oven or the cold-box, till it would keep the same rate in the different temperatures, when it was called "adjusted." What he meant to say in his former answer, was that if Mr. H. could not make this adjustment, either from want of the apparatus or not knowing how, it would not be advisable to cut the rim, as its action after cutting might not be so good as before. It would be impossible to give instructions for making the adjustment to temperatures, within our limits, and he did not think it advisable to give any vague general explanations, which might mislead the reader, so long as full details could be found in Excelsior's book, which every good workman should have on his shelf.

SOLDERING GLASS AND JET.

Secretary of Horological Club:

In the January number I noticed among the communications to the "Secretary Horological Club," a letter of inquiry from W. S. H. One of his questions, I think, has never been answered through the columns of the "Proceedings of the Horological Club," which is "How the jewels are fastened to settings? Is there any way to make solder adhere to glass or jet?" It is a question I have often asked of manufacturers, but never received any satisfactory reply. I think if the above questions were answered through your columns it would be beneficial to a number. C. N. G.

Mr. Rolliver replied that soft solder would adhere to jet, but not to glass. This explained how the sample of jewelry sent in to the Club was made. The usual way of fastening jet or glass, when the gold cannot be put around the edge of the setting, is to use black enamel, or shellac.

NEW WAY OF MANUFACTURING DIAMOND RINGS.

The Secretary read the following newspaper scrap, sent in by some correspondent for our information:

"HOME MANUFACTURE.—Mr. E. H. True, the watchmaker and jeweler, has just finished a diamond ring that proves him a workman of no small order. It contains 12 diamonds that were cut and polished by Mr. True. The ring is made out of scraps of gold that were cut from old rings, etc. In melting the gold the composition was fluxed so that the gold was highly refined, the fineness of the ring being about 22 carats—about 8 above standard gold coin. The ring was cast in a mould, the diamonds being covered by an ochre paste so as not to be injured by the fused metal. The amount of dross remaining in the crucible after the smelting was nearly the size of a pea, which shows that the refining process worked to perfection."

Mr. Blow-Pipe requested the honor of holding that extract in his own hands and seeing it with his own eyes. After reading it over very carefully seven times, he declared it as his settled conviction that that jeweler was no common old man, but a genius,—in fact, a natural born jeweler. It was a disgrace that a man who could cut and polish twelve diamonds should be obliged to melt up old scraps to get gold to mount them with. The world ought to be ashamed of itself for letting such a man linger along in poverty and obscurity. But nobly had he shown himself superior to the frowns of adverse fate. Not only had he discovered that an ochre paste would protect diamonds from injury by fused metal,—a discovery worth millions, perhaps,—but he had actually cast his ring in a mould! He fluxed the metal and poured it in, and lo, there was the ring,—"a thing of beauty and a joy forever."

But that fluxing business was what got him, continued Mr. B. It fluxed it so flux that it made it eight karats finer than gold coin, or about 30 karats fine. Here, indeed, is richness for you, continued Mr. B. But how is it done? What is this wonderful flux? Is it genuflux, or bloody flux? If the latter, then he was immovably opposed to its being introduced into general use, as it would be a dangerous process to follow. But perhaps it was nothing but fluxtuation. If so, he thought it would be perfectly safe to try a little on a small scale and see how it worked. But he couldn't exactly understand how such a powerful flux as this must have been, had produced so little dross. It would have been more natural to look for a lump as large as a tea-cup, or even a sugar-bowl.

Was it possible that the new flux had fluxed some of the dross into 30 karat gold? Had this true jeweler discovered the long-sought philosopher's stone, and was it the great good fortune of this honorable body to be the first to announce the fact to an awe-struck world? Really, he thought this matter should be investigated during the recess, and he moved the appointment of an 8 by 7 committee to find the facts in the case, with an appropriation of $20,000 to pay for paper, ink, postage stamps and other incidental expenses. Of course, the committee should serve without pay, but each man ought to be allowed a private secretary and two messengers, with $100 per day for ice water and other necessary personal disbursements. It would never do to be niggardly about a matter of such vast importance as this. If we found what we were after, it would be a big thing for the country, and ultimately for humanity itself. If we didn't find it,—why, we looked for it all the same, and nobody could blame us, but only the true jeweler.

At this point, the exciting nature of the subject, together with the terrible sultriness of the evening, had worked the members up to fever heat, and fearing that their health would suffer unless they took immediate measures to restore the normal temperature of their respective physical systems, the Club then adjourned, leaving two or three communications unattended to, notwithstanding the opposition of Mr. Clerkenwell,—that gentleman wishing to make his peace with Amaltheia, who had sent in another letter this month.

FUSIBLE Cement, a substitute for soft enamel, may be made as follows: Analysis of the Vienna white cement for repairing broken dials shows its composition to be oxide of zinc and some colorless resins, very soluble in alcohol. It may be prepared in this way: Take equal parts of demmara and copal resin, as near colorless as can be obtained, reduce them to a fine powder; to five parts of this mixture add two parts of Venice turpentine, and rub the whole into a thick paste, by adding as much spirit of wine (alcohol) as is necessary; add now three parts of the finest white zinc, and continue grinding it until of the consistency of oil-ground paint; the extreme whiteness may be modified by adding a very little Prussian blue to the alcohol in which it is rubbed up; the mass must then be gently heated to drive off the alcohol. It may also be prepared by melting the resins together, extreme care being taken not to discolor them by burning, adding the zinc while they are in the melted state. Probably various colored cements might be prepared from this basis by the addition of the proper pigments.

Ancient and Modern Jewelry.

ONE of the weaknesses of humanity, from the advent of man on this lump of clay, has been to complete the adornment of his body, which, according to his judgment, the creator has not made handsome enough for the exalted position he called him to occupy. After man had supplied the first elementary wants of incipient civilization, and perhaps before, we find him introducing personal ornament, and adding color to the monotonous tint of his flesh in the shape of bright pebbles, pits of fruits, berries, etc., and if we may judge of our prehistoric ancestors by what we hear of the uncivilized inhabitants of some portions of the earth, we find that they have a peculiar taste for strong colors, and failed to appreciate the "*low-tones*" of civilization. But take the savage who has a ring in his nose, and sits nodding during the homily of a missionary, and the extra-civilized Christian who sits in a fashionable church, with oscillants pendant from her ears, to hear the Rev. Adonis Sweetbread descant on the benightedness of the poor, the principle is the same, and civilization has only altered the motive. The difference between the two is what is termed *civilization*. While for the squaw a shell, a pebble, a colored seed will do, the civilized woman wants precious metals and precious stones wrought by Samper, Tiffany, or Froment-Meurice.

If we look back through the history of the world, we cannot help but be convinced that gold seemed to be much more plentiful in the early periods of civilization than it is now, although Australia and California, Peru and Mexico, have thrown large quantities of this precious metal on the market. No doubt the primitive inhabitants of India found untold mines of gold in the valleys of the Himalayas, or in the beds of the rivers and streams of Asia. We read in history that at Rome and even in the Lower Empire, statues of solid gold were found, but the intrinsic value of the metal caused the destruction of nearly all the gold work of antiquity during the terrible invasions of barbarians which swept civilization for a time from the face of Europe. To take only one instance of weath, the Israelites; they were a nation that had been held in bondage, and that with difficulty obtained its freedom from slavery, and they must necessarily have been not very well off; yet they seem to have plenty of gold jewelry, for after making a golden calf, which was destroyed, they had enough and to spare for the stupendous ornaments of the tabernacle. When they grew into a powerful nation, the description of Solomon's Temple throws into very dark shadow the most expensive efforts of modern architecture. Let us, for instance, look at the opera-house in Paris, which has been by far the most expensive building erected in modern times. It is a temple of what we call art, no doubt, and built to enshrine another art; but what would Solomon say were he to see it. If he took out his pocket-knife to scratch the gold work he would soon see plaster "of Paris," and cry with the French: "*trop de dorure*," and, laughing in his sleeve as he went back to the next world, add, "*mais pas assez d'or*." There certainly must be some truth in the descriptions of the wealth and treasures of the Asiatic and Grecian warriors left to us by the historians of antiquity.

What became of all these treasures it is hard to tell, for the precious metals that have come down to us from olden times have been found buried under the ground, hidden in tombs, which the superstition or ignorance of the barbarian invaders screened from pillage. Another theory may be admitted: in those days of feudalism only the lords and princes possessed riches and jewels, the poor and middle classes could not purchase them, nor cared they for them; but in these days, where wealth is equalized, nearly every one has some trifle, be it ever so small, made of precious metal; thus were great treasures disseminated. Steam, machinery and industrial art have overthrown the monopoly of gold possession, and every one now may possess as much jewelry as he is able, or is supposed to be able to pay for.

If we look at the difference between the modes of production of the present day and that of past periods, we note some important changes. To the present day in the East jewelry work is done, as it most probably was done in antiquity, and with as much skill. A small group of two or three itinerant craftsmen come round at a stated period of the year, and pitch their tents on the road near the house of some grandee, and receive a few ounces of gold. They drive their anvil into the ground, squat on their rugs, and with great diligence and skill work from morning till night, fashioning the precious metal they have received into exquisite shape, receiving their food and a small amount of coin as their stipend. When the job is done they move away to some other place.

Antique jewelry found in the earth is divided into two distinct classes: the jewelry worn by the rich, and the jewelry made to be entombed with the dead. The largest quantity of the antique gems that are to be seen in the Castellani, the Campana and the British Museum collections belong to this class, while those that are to be admired in the Cesnola collection in this city belong to the first. The difference is that the pendants, fibulæ, plaques, earrings and crowns designed to ornament the dead were made on an economical principle, and very light. The Egyptians, the Greeks and the Etruscans were in the ancient times masters in the craft of the goldsmith. The great characteristic feature of the ancient jewelry is that in work of the finest quality the ornamentation consists of separate pieces shaped and wrought by different means, which are soldered and welded on the surface of the jewel. The delicacy of the work and the means employed to make the ornamental particles adhere to the body of the piece have long been a subject of speculation to workmen. The "Castellani," from father to son, have in Rome sought to unravel these mysteries of craftsmanship. In Sant Angelo, in Vedo, in the the Apennines, far away from all vestiges of civilization, they found primitive workmen who still used the old methods employed by the Etruscans. The Castellanis professed to form a special school of artisans who reproduced the antique work, yet that was perhaps an unnecessary trouble. One of the principal features of the American section of the Paris Exposition is a case in Tiffany & Co.'s exhibit full of facsimiles of some of the most exquisite specimens of antique jewelry which General di Cesnola dug up in Curium. The reproduction is so perfect as to baffle the most expert antiquarians. J. G. Brown, in this city, has so closely imitated several objects in the Castellani collection, that the original goldsmith could not tell the difference, and yet the workmen who made these pieces did not come from Sant Angelo, but learned their trade in this country, and it is very improbable that the ancients possessed secrets of craftsmanship which modern science has not revealed.

During the middle ages jewelry seems to have been still the exclusive prerogative of kings, and of that eminent power in those days, the clergy. St. Elonysius enriched the treasury of King Dagobert of France and the Abbey of St. Denis to such an extent that he became the patron saint of the metal workers, and before that Charlemagne had, by conquering the Huns, the Visigoths, and other barbarous tribes of Germany, retaken some of the treasures stolen from Italy and Greece, and those which enriched the treasury of France. Suger, in 1144, did much towards forwarding the manufacture in Europe. Count Thibaud, nephew of Henry of England, who gave magnificent presents to the Abbeys of Cisteaux and Fontevault, sold at a very low price a large quantity of sapphires, hyacinths, rubies, emeralds and topazes for the works of Abbé Suger.

In the thirteenth century the religious art of metal work seems to reach the highest pitch of perfection. The masters of the "Renaissance," among which Lorenzo Ghiberti, Bruneleschi, Donatello, Antonio del Pullajuolo and Thomaso Bigordi are counted, without omitting Benevenuto Cellini, whose reputation owes, perhaps, as much to his sword and his pen as to his chisel.

The next great epoch in the history of jewelry comes in the seventeenth century, when the introduction of cut stones and diamonds overthrows the designs of the workmen of the Renaissance, who had introduced the human figure in every form and shape.

From this period till to-day the transition is easily followed. At the present time we have no special style of jewelry, the generality of which consists in that used in prior times, but which the mechanical methods of the present day allow us to produce at lower prices than before. The great difference between the modern and the ancient work is that in olden times the artisan was generally his own designer and modeler, and the work was often modified during its production. When one piece was made it was seldom repeated, because the artisan preferred making a new piece, which, while it interested him, cost him no more labor than the reproduction of a piece previously made. In these days, on the contrary, the designer and the craftsman are quite separate, and production is gauged by the sale of the piece made, which, once the machinery for it is made can be repeated ad infinitum. Jewelry of a peculiar character can be made by hand for those who wish to pay for it, and our artisans of to-day are in no respect inferior to the ancients; the only question is whether the free and unconstrained style of the old work is preferable to the mathematical precision of the modern.

Practical Hints on Watch Repairing.

By Excelsior.—No. 40.

EXAMINING AND CORRECTING THE TRAIN.

(617) A series of wheels geared together is called a train. In a watch there is a motor or motive force, which drives the train; the motion of the train is checked and regulated by the escapement. Having finished our examination of the escapement, we have next to see to the condition of the wheels, pinions, pivots, pivot holes or jewels, cocks or bridges, screws, depthings, pivot fittings, end shakes, springings, stop works, gilding, etc., etc. As some of these points require more than a passing notice, such will be deferred till we have first given directions for examining the train of each sort of watch by itself,—beginning, as with the escapements, with the lepine or cylinder escapement watch, and ending with the chronometer. We will then consider those points which more or less concern all of them. As these articles are written for the benefit of all classes of workmen, some portions will be familiar to many of our readers, although new to those of less experience. There will also necessarily be some repetition of names of parts, etc., and no attempt at elegance of style will be made, but only to have the statements precise and unmistakable, and to include all the points of value to the practical workman.

(618) In examining, you should have a slip of paper and a pencil on the bench, and whenever you discover any defect make a note of it, stating briefly just how it is. Sometimes we cannot immediately make the necessary alteration, but must wait till the watch is taken to pieces, or till we have taken into consideration the state of the connecting or contiguous parts, before we decide upon the proper remedy. Interruptions by customers or otherwise might cause us to forget certain points. But with this list before us we can run over the items, marking them off when done, and be sure that nothing has been overlooked. It is also a great help in booking the repairs made, and the defects (if any) left unchanged. Narrow slips are preferable, so that a line can be given to each item, however small,—making it easy to find any item and cross it off; also to figure up the price. Each one should be headed with the name of the owner maker, description of the watch, number on case or movement, or both, date, and name of workman making the repairs.

(619) In examining the train, we take the watch apart, as far as practicable, from the escapement through to the barrel. In putting it together, the reverse order is followed, beginning with the barrel and finishing with the escapement, after which the motion wheels, (as the dial wheels are termed,) dial, hands, etc., are put on and adjusted. The wheels are numbered from the largest down to the smallest or escape wheel. The first is called the main wheel, the second is the center wheel, next is the third, then the fourth, whose pivot carries the seconds hand, finally, the escape wheel. In the duplex, the wheels are named in the same order, although the "center wheel" is not in the center, but the fourth wheel is, and carries the center seconds hand. In double-timers there are two trains, and two "center wheels," neither of which are in the center. The pinions are called after the wheels which they carry, as center pinion, third, fourth and escape wheel pinions. If the wheels are held between two plates, the lower or main plate, to which the pillars are fixed, is called the pillar plate; the other, the upper plate; by some, the upper pillar plate. In watches having a potance for the balance, as verges, some cylinders, American and English levers, the upper plate is called the potance plate. Many watches have only the main plate, upon which are screwed the cocks or bridges which support the upper pivots of the pinions. Movements are called full plate, three-quarter plate, or half plate, from the dimensions of the upper plate.

THE LEPINE ESCAPEMENT AND TRAIN.

(620) Directions for examining and adjusting the cylinder escapement are given in Practical Hints, Nos. 17 and 18, Aug. and Sept., 1876. But as that escapement was not treated as fully as the others, owing to a change of plan after those articles were written, a few items are added here. The three small dots generally found on the plate, near the balance rim, are intended to show the amount of the lift of the escapement, which is ordinarily marked equal to one-third the diameter of the balance. This, however, is not always correct, as is explained in section (312), under "apparent angle of escape," which see. But assuming it to be correct in the present case, when the escapement is in beat and the balance stands at a free rest, the dot on the balance rim should be just opposite the middle dot on the plate, and it will be so unless the balance or cylinder has been altered during some repairs. But if it is not, and the watch is in beat, (302,) try the banking, (304). If that is correct, then a new mark should be made on the balance rim opposite the center dot. But if the banking is changed in the same way that the balance dot was wrong, it shows that the balance is not properly staked on the cylinder collet, or the cylinder has been turned in its collet. This last sometimes happens, by the cylinder being driven out and not properly replaced in the collet or brass. This is easily tested by tapping on the cylinder *shell*, not on the upper plug. If the cylinder is loose, change its position in the collet. If tight, we must either drive the collet out of the balance and restake properly, or else both move the banking pin in the balance rim, (304), and make a new mark opposite the middle dot on the plate. Inexperienced workmen often make a great deal of unnecessary trouble for themselves and others, from not knowing the object of these dots and that the balance should be staked on with its dot in line with the two cylinder lips. The hair-spring stud will lie in the same line when the watch is in beat.

(621) Having the balance dot and its banking pin in correct position, and the mainspring wound a little, press your oiling wire gently against the balance rim, and move it slowly each way till the escape wheel tooth drops. These drops should take place when the dot on the rim is opposite the outside dots on the plate. If the lifting carries the rim dot beyond or outside of the plate dots, before the drops of the tooth, the lifting is too great; if the drops occur before the dots coincide, the lift of the tooth is too small. In the former case, the potance or slide which carries the cylinder should be moved a little back from the escape wheel; in the latter, move the slide towards the wheel. First, however, try several teeth, to see if the action is alike on them. Remember, always, before removing the balance, to either let down the mainspring, or block the escape wheel with a bristle, else you may have a broken wheel or pivot by the watch running down. In case the drops do not occur at an equal distance on each side of the center dot, the watch is not in beat, or one of the cylinder lips is worn or injured, (299), causing one lift to be greater than the other.

(622) We now move the balance say to the left, till the tooth drops, then to the right till the tooth is inside of the cylinder, but can only touch the rests or circular parts of the shell, not either of the lips. Then wiggle the wheel, and see how much play the tooth has in the cylinder. Next get the cylinder between two teeth in the same way, and test the play between the teeth. The play should be the same inside and outside of the cylinder, and very slight in each case, (305). If the play both inside and outside is too small, or not perceptible, the cylinder shell may be too thick; if not, the teeth are too long from point to heel, and should be shortened, (307), till there is a slight freedom or play. If there is too much play both inside and outside, the teeth are too short, and the cylinder will wear fast where the teeth strike it, and the watch will be hard to regulate.

(623) If there is too much play inside, but none or not enough outside, the cylinder is too large and should be changed for a smaller one. But if the outside play is enough for freedom, although the inside play is too great, no change need be made. The cylinder is a little too large, but is thin, and if its opening is of proper depth (308) and the teeth well shaped, good performance may be expected. If there is too much play outside, but none or not enough inside, the cylinder is too small and should be replaced. But although the

outside play is greater than that inside, if the latter is enough for freedom the watch will time well, and the cylinder need not be changed. If we have a thick cylinder, (308), with no play outside, and too much inside, it shows both a cylinder too large, and teeth too short, and both cylinder and wheel should be changed. Sometimes the escape wheel teeth are not of equal length, and, before making any alteration, the wheel should be tried all around. If some teeth are correct, while others are too long, (shown by difference of play inside the cylinder,) mark the latter as you come to them with a bit of rouge and oil, and shorten them up slightly, leaving the points neither too pointed nor too blunt, (307), and well polished.

(624) In a correctly proportioned and well adjusted escapement the balance vibrations should not be materially larger when wound entirely up than when only wound enough to give a fair normal vibration. To try, notice the extent of the vibrations in the latter case, by comparing the place of the banking pin on the rim with the dots on the plate, after resting in the horizontal position long enough for the vibrations to take their uniform and natural extent. Then wind entirely up, without stirring the movement. If the vibrations increase more than, say 1-16 inch, the cylinder is a little too small, so that the function of "control" is not sufficient. If the vibrations are less when wound up, the cylinder is too large, and the greater pressure and friction of the tooth on the circular part of the cylinder shell surpasses the increased power of the tooth when acting on the impulse lips in the lifting. This is supposing a correct increase in the power of the mainspring by winding, and the stop works properly adjusted. In many cases the mainspring (if a little short) can be altered to get all necessary corrections for the above mentioned faults. In either case, (increase or decrease of arc,) a longer mainspring will increase in strength more slowly by winding, and the stop works should be adjusted to embrace only the lower turns of the arbor, and cut off the last turns, where the stiffness increases most rapidly. There will then be less necessity for the "control." Of course the spring may be strong or weak, according to the needs of the movement,—the point being to have as little *difference* in strength as possible from the winding. Any slight remaining variation in the arc of vibration will be compensated by the hair-spring, if fitted in accordance with the directions given in the articles on isochronism. A well made and adjusted lepine, although a low-priced watch, will hold its own with movements of much greater cost and pretensions.

(625) If the web of the escape wheel stands too high or low in the larger opening of the cylinder, and the latter cannot conveniently be raised or lowered as directed in section (300), the arms of the escape wheel can be bent slightly to raise or lower the web, by resting them on a flat brass or tin block, and striking them near the center of the wheel with a brass punch, being careful not to use too much force. Testing the extent of the small opening of the cylinder with the Jacot gauge is treated in section (308). If the watch when carried has the fault of "banking," the normal vibration of the balance is too great, (303), so that every little shake or jar may cause the pin on the balance-rim to strike the banking pin on the bridge, and of course the watch gains time, or stops (303, 304). Try the effect of a weaker mainspring; then, of lessening the lift, by moving the potance back. If the fault still remains, a heavier balance must be fitted.

626 A few mechanical defects remain to be noted. Directions for examining the escape wheel as part of the escapement are given in sections (301, 309, 311, 312). To try the end shake of the pinion, we do not test its freedom by moving it with the tweezers, like other pinions, as the bridge is often so limber that it would be sprung thereby, and show an apparent play when there was really no freedom at all. The proper way is to press down on the end of the bridge. If it yields under the pressure, and springs up again every time the tweezers are raised, there is end shake. This should be very slight, but distinctly perceptible,—say equal to the thickness of the cylinder shell, or of the teeth. Use the glass in this test, and watch the end of the bridge. If there is no shake, or not enough, raise the bridge, (301). Before doing this, see if it will not bring the bridge in contact with the balance. If the bridge must be raised, and the balance is very near, see if the latter cannot be raised without coming too close to center wheel when raised to its highest end shake, the wheel being at its lowest. If it can, spring the balance arms up, and true up in the calipers. If it cannot, the escape pinion shoulder, either upper or lower, must be shortened a little.

(627) To try the freedom of the balance from the escape wheel bridge, bring one arm over it, and see if there is freedom the whole distance from the end of the bridge to the balance rim. If the balance arms are not true, try each one. Sometimes, in very thin watches, where the fitting is close, the balance arm will rub on a thick jewel, or strike on a long upper pivot of the wheel. To try the latter, raise the escape wheel to its highest end shake with a bristle, without springing the bridge, then pass the balance arm over it. If it touches, or comes very close, shorten the pivot. If the jewel is too thick, its projecting part can be ground off as directed in the article on jeweling, to follow hereafter. See that the banking pin in the balance cannot touch the case band, nor the joint of the dome or ins de cap. Sometimes the joint will touch when shut, but not when open, and must be trimmed off to clear. If the end of the case lifting spring comes near the balance, see if it can touch the banking pin when the front cover is shut. If so, file the end of the spring, or, when that cannot be done, shorten the banking pin a little if very long, (304). If that cannot be shortened safely, we must raise or lower the balance rim by bending the arms, or fit a lift spring of different length or shape.

(628) The escape wheel bridge (and all the others as well) should be secure against accidental shifting of position. But we must not depend on the screw to keep it in place. Steady pins are provided for that purpose, and should be made to hold the bridge where it belongs, and keep the wheel horizontal and at the proper height in the opening of the cylinder. Bending the pins forward will draw the cock back, and *vice versa*. If the pivot hole or jewel is to be moved sideways, the pins must be so bent as to turn the bridge around its screw as a center: the pins outside of the screw are bent in the direction the jewel is to go, those inside in the opposite direction, and more or less in proportion as hey are further from or nearer to the screw. After bending a steady pin it will not go down in its hole, and its back side must be filed vertically, from the end to the surface of the bridge,—leaving the end of the pin in its full size, so that it will snugly fill its hole as before, and prevent shifting of the bridge. Very often we find steady pins of extra length, and fitting very tightly in their holes. On pressing the bridge down, the pins stick till the pressure is considerable, then suddenly slip into their holes, and there is great danger of bending the pivot or punching it through the jewel. Such pins are dangerous, and should be shortened and the ends rounded up, till a gentle pressure will force them slowly and gradually into their holes, without any slipping or jumping.

(629) See if the lower corners of the escape wheel pinion rub on the brass around the jewel. The leaves are often spread by careless staking of the pinion in the wheel, and when so the projecting corners should be turned down in the lathe. Even when the leaves are not spread, if the corners rub as described they should be turned off enough to clear, unless the fourth wheel gears into that part of them. If so, turn out the side of the pinion sink till the leaves are free. If there is no shoulder to the lower pivot, or a very short one, the pinion leaves are apt to drag in the oil and become full of grease and adhering dirt, and soon stop the watch, besides deranging the running while it does go. If possible, the pinion leaves should be shortened up by turning off to form more of a shoulder. If this cannot be done, only use oil enough to spread over the pivot, with no surplus to draw up into the pinion.

(630) If the escape wheel teeth can touch the sides of the wheel

bed or "sink" turned out for it in the plate, the sink should be turned out larger, or dressed out with the graver. If the teeth touch the fourth wheel pinion, and that is upright and correct, a groove must be turned in its leaves to clear the teeth. Or, if this groove is above the portion used by the third wheel, the whole of the fourth pinion leaves may be turned off and shortened down as much as necessary to clear, and the ends nicely faced up and repolished. If there is plenty of room between the third wheel and the bottom of its sink, it can often be lowered to admit of the above alteration of the fourth pinion, by bending down its arms. Sometimes the escape wheel rubs on the fourth wheel, especially when the latter is considerably thicker around its center, with a raised disc or sort of hub. The teeth may also rub up under the brass collet of the cylinder, or the upper edge of the large opening, or on the end of the upper plug.

(631) If the escape wheel teeth touch the third wheel teeth, and the latter wheel cannot be raised or lowered enough to clear them, and the depthing in the fourth pinion is not deep enough to allow the wheel to be turned off a little smaller, the third wheel must be moved, by plugging up the lower pivot hole, and drilling a new one further away. If the holes are jeweled, which is not generally the case in lepines, the lower jewel must be knocked out, the hole plugged up, the place for new hole found as before, then set up the plate in the lathe with that point for the center, and fit in a jewel as usual. The upper hole is then brought over the new lower one by altering the steady pins in the bridge, and in some cases a new screw may be required. This fault is a serious one, but fortunately is not very common. The faults of the rest of the lepine train are the same as in the detached lever or "anker" train, and will be given there for both,—which see. I will only add, for the convenience of the workman in selecting either a new balance or a new escape wheel, that the diameter of the wheel is one-half that of the balance; and, of course, the balance is twice the diameter of its wheel, and the same as the barrel, without the teeth.

(632) The hands, dial, motion wheels and balance being removed, there are two ways of examining the train open for our choice. If we are merely looking over a sales watch, or searching for the cause of a stoppage, or any similar purpose, we can shorten up the process by first examining the barrel and attachments, then removing them, and testing the remainder of the train together, all at once. But if we are to make a thorough job of it, we proceed from the escape wheel through, ending with the barrel, as already stated. The former method is followed by professional examiners of new watches, especially with lepines, when the quickest and easiest way is sought to discover the faults of construction which have been passed by the movement and motion makers, springers and finishers, but which must be removed before the watches are sent out and put on the market. The following is an outline of the method, but details and directions for correcting the various faults will be given under the head of Ankers, with the other and more thorough method of examining.

(633) The barrel is tested as to its freedom in the plate, between its bridge and the plate or lower bar; depthing of main wheel in center pinion; freedom from center wheel, its own bridge, and click, spring, etc.; end shake of barrel on arbor; action of click in ratchet wheel, of mainspring, stop works, etc., and the barrel is then removed. We then watch the train carefully, using the glass, while running the center wheel backward and forward, or quickly wiggling it, with the peg wood point, or even the finger nail in its teeth. Using a very light pressure, we can see if the whole train is perfectly free. If there is any catch, we gently wiggle the wheel, and find how far the train is free: the first wheel or pinion that fails to move is, of course, the location of the fault, which we proceed to find out. It may be dirt in the teeth or under the wheel, or in the pinion, teeth bent, or too blunt, rubbing of parts that ought not to touch, want of end shake, or freedom of pivots in their holes, holes too large, pivots bent, wheels out of flat, or out of true (not round), depthings too shallow or too deep, etc.

(635) If all appears to be free and correct, and the train will run on easily after the peg wood is taken off, in either direction, and with either side up, we apply the final test. Fastening the plate in the movement holder, we press the peg wood point on the pivot of the third wheel, to slightly restrain its freedom of movement, then press the center wheel forward. If any catching is felt, there is some fault in the action of the center wheel in the third pinion. But if the motion is perfectly smooth and free from any jarring or beating, we press the peg wood on the fourth pinion pivot, and try the action of the wheel in that, in the same way; then on the escape wheel pivot. Should there be any fault in the depthings, we shall feel each tooth butt or strike as it passes; or, if only a few teeth are wrong, we shall feel them when they come into action. But if the wheels all run freely and smoothly, we may conclude that the wheel and pinion actions are good. How long they will remain so, will depend on the depthings, the polish of the pinions, leaves, etc. If the depthings are shallow, or the bridges can shift and make them so, or the pinions are rough, the front corners of the teeth will soon wear and stoppage will occur. Particular attention should be given to the bearing of the fourth wheel and escape pinion, as that is one of the most common sources of trouble. In doubtful cases they should be tried by themselves. Being at the end of the train, where the motive power is least, a fault will be fatal here which would be of no consequence further back. The proper action of wheels and pinions, proportionate sizes, shape of teeth and leaves, depth of intersection, etc., will be treated in the article on Depthings. In putting a lepine together, the quick way is to begin with center wheel, square and cannon pinion, and go on through, testing the freedom of the train altogether, finishing with the balance, then put in the barrel. Oil every hole, and every tooth of escape wheel slightly. The better way is to begin with the barrel, then the center wheel, and so on, testing every bearing, end shake, etc., as you go along, and finishing with the balance, as directed for Ankers.

Old Blue Nankin.

NOT long since there was a sale in London of old blue and white Nankin ware, at which veteran collectors were positively astounded by the prices given. The taste for this exquisite ware, which was first introduced into Europe during the sixteenth century by the Portugese and Dutch merchants trading with China, has rapidly revived in England within the last 20 years. Holland has long been celebrated for having in its kitchens numerous specimens of these "bits of blue" over the quaint chimney or on the chimney shelf. The most of the English collections were made in the old Dutch country, though the search has been generally a costly one. At the sale to which we refer there were 168 pieces sold, the quality being of the highest, the collection having been made with great judgment. As showing some of the prices realized, we quote: A pair of small basins of the hawthorn pattern fetched $150; another pair with figures, $295; a single basin with Hoho birds, $120, and another with dragons $150. But this was only a relish of what was to come. A jar and cover brought $565; a pair of small oviform vases and covers, $440; a long-necked bottle, $300; a basin, $215; a pair of bottles with dragons, $383.80; a large dragon bottle, $575; a set of three jars, $725; a tall vase, $590; a pair of hawthorn ginger jars—blossom, bud and stem—no less than $2,150; a set of three vases, $1,065.50; a long-necked bottle, $740; and a vase with branches of hawthorn, $565. This was not all, and the high bidding continued in a spirited manner. The next ginger jar of hawthorn fetched $1,200, and the next $2,500. Then came a coveted pot, with its own undoubted cover, which added so much to its value that it was sold for the large sum of $3,200; and the still higher price of $3,456 was paid for its companion jar, similarly adorned.

OPALS are not only in fashion again, but they are likely to continue so. A pendant of Persian design is set with a perfect drop-shaped pearl, weighing forty five grains, like a moon in the midst of flashing star-like diamonds. Earrings complete this set.

The Colors of Precious Stones.

BY PROFESSOR A. H. CHURCH, M. A.

THE analysis of beauty is seldom perfect in method or useful in result. The artist, be he painter, sculptor, poet or musician, is inclined to resent the intrusion of science into his domain. Science, he thinks, with her cold, unsympathetic touch, can neither explain nor enhance the beauties of art—can, indeed, if active at all, act only so as to dissipate the poetic elements. Though this is not the place to discuss and defend the general position that reason and imagination, that science and art, rightly working together, must be mutually helpful, yet the subject we have selected for study in the present paper may afford a special case, illustrating and confirming such a view.

We proceed, then, to inquire what special elements of beauty are combined in the colors of those minerals to which the name of gems or precious stones is usually applied. But we must not lose sight of the fact that these materials are endowed for the most part with those physical properties of hardness and permanence which render them pre-eminent amongst substances possessing beautiful color. Other colored materials may be characterized by transparency, or by brilliant lustre, but are usually deficient in durability. Soft, or amenable to ordinary injurious influences, or lacking in stability of constitution, many a substance of lovely hue, perhaps a pigment or glass or tissue, perishes with all its charms. But with gems such a fate is in most cases impossible. Gems are prized, and rightly prized, not only because of their rarity, but also by reason of their concentrated and durable beauty. This being granted, we may now investigate the peculiarities which their colors present.

It will be convenient to group precious stones, for our present purpose, after the following manner:—

GROUP I.—Transparent stones, homogeneous in color and structure, and belonging to what is called the cubical or monometric system of crystallisation. Examples of this group are furnished by the garnet, the spinel and the diamond.

GROUP II.—Transparent stones, belonging to any crystalline system other than the cubical. This group includes the ruby and sapphire, the emerald, the tourmaline, the topaz, and other well-known gems.

GROUP III.—Translucent and opaque stones, some crystalline and some amorphous. The cat's-eye, the opal, and the turquoise are included in this group.

In Group I. the colors of the various stones are not marked by many distinctive characters—they closely approach in quality of color the imitation gems made of glass, or paste, as it is often called. There is a great range in the hues which these stones exhibit; but an individual specimen seldom shows any irregularity in the tint or distribution of the color. Why are the stones of this group more beautiful or more covetable than the most successful imitations of them which have ever been made? Because of their surface-lustre, or polish, which, in the case of the diamond, is more intense or perfect than that of the imitation materials; because, too, of their superior hardness and consequent durability; and, again, because of certain optical qualities which are possessed by some at least of the members of this group. The red garnets, for example, present a curious collocation of red and blackish red, due in part to a peculiar absorption of light in a transparent medium, and not to the presence of an opaque substance. Then, again, the diamond shows not only an intense reflection of light from its external surfaces, but also the phenomenon of total internal reflection; while much of the light thus reflected within the stone is also at the same time refracted and dispersed, thus causing the appearance of those brilliant prismatic hues known to jewelers as *fire*. Such optical effects as these are, it is true, imitable in some degree, but they cannot be combined in false gems with the essential quality of hardness. And, moreover, the exact hues presented by some garnets, spinels and diamonds have not been reproduced with exactness, and perhaps could not be secured with certainty. Some of the hues of the spinel are rare: we have a deep amber yellow, an aurora red, a puce, a lilac, a lavender, and an indigo blue. Usually these stones are valued only when their colors are such that they can be used to replace or simulate the pink or red of the true ruby. The range of color in the different kinds of garnet is less extensive, but it has recently been enlarged by the introduction of a green variety of this stone from the Ural. These green garnets occasionally assume the hue of the emerald, but their usual color contains more yellow; sometimes, indeed, verging upon olive-green or brownish-yellow. This gem is not in reality a true garnet, but a different, though allied, species of mineral. Unfortunately it is but little harder than glass, otherwise it would prove a welcome addition to the series of precious stones, its "fire" being very conspicuous, and the quality of its greenish-yellow hue very lovely. That variety of the true garnet, called correctly essonite, or cinnamon stone, and incorrectly jacinth, has a fine watery or wavy texture, combined with a rich and deep amber color, verging upon the red of glowing charcoal. The red of those garnets which are used, under the deceptive name of "Cape rubies," as substitutes for the true ruby, is very nearly pure, while the almandine garnet sometimes has so much blue or amethyst in it as to approach the amethyst in hue. As to the diamond, the most precious of all the stones in this Group I., the color is rarely pronounced, very often being of a straw-yellow or faint brown; blue, red, or green hues of any depth being of rare occurrence. But the surface-lustre, almost metallic in intensity, of the diamond, combined with its extraordinary *fire*, makes up for any deficiency in richness of color.

To Group II. all stones possessing the more interesting qualities of color belong. We cannot do more than indicate the direction in which the chief peculiarities in the colors of those stones must be sought. Undoubtedly their most notable property is that to which the name of *pelochroism* has been given. Without entering into a scientific disquisition as to the causes and exact nature of this phenomenon, we may present in a few sentences an epitome of its main characteristics. In order to make our explanation as clear as possible, we will take the case of a particular precious stone—the emerald. Now the emerald, which crystallises in the form of a six-sided prism, is distinctly *dichroic*—that is, it shows two colors. These colors originate thus:—When a beam of white light falls upon an emerald at right angles with any of the faces of the prism and traverses the stone, that light is in part resolved into two pencils polarized in different planes. These two pencils of light are also differently colored, the elements of the original beam of white light being in part distributed or divided between them. In colorless crystals belonging to this group of precious stones, the white beam of light is, indeed, divided, by double refraction, into two beams, but both of these are colorless; in colored stones, however, such as the emerald, which we are now considering, the beam of white light is not only divided into two beams of different colors, but these colors are so distinct and definite that there can be no question but that their presence in the cut specimens of the emerald imparts a richness and rareness to the hue of this gem which no imitations exhibit. If a small parcel of cut emeralds be examined, it will be noticed that their color varies between two hues of green, one with more blue in it than the other. An emerald may be so cut as to show a preponderance of these two greens—the pure green or the bluish green; or it may show, by the internal reflections from some of its lower facets, one hue, and from other facets the other. But although this dichroism as seen in cut emeralds widely separates this stone from its imitations, yet there is a little instrument, known as the dichroiscope, which enables us to discern this characteristic property of the stone with greater distinctness, even in the palest beryls and aquamarines. The dichroiscope separates the two oppositely polarized and differently colored beams of light from each other, and presents them to the eye in two small contiguous squares. Thus examined, a bit

of green glass or paste shows two squares of green absolutely identical in color. All colored precious stones of this group show some difference between the two images of the square opening in the dichroiscope; the sapphire, for instance, giving a pale yellowish green, or straw color, with a deep velvet blue; the ruby shows two reds, one verging upon red-purple or violet, and the other nearly pure; the topaz, when of the usual sherry color or warm amber hue, exhibits a pale ochreous tint and a delicate rose-pink, the latter color alone surviving the treatment known as "pinking," in which the stone is strongly heated. The chrysoberyl is another gem which is strongly dichroic, so is also the amethyst. But the most characteristic species of the whole group is certainly the tourmaline. This stone occurs in a great variety of colors, though brown and green are the most usual; a lovely pink is also found, though rarely of perfect transparency. A good notion of the twin colors shown by individual specimens of this mineral may be gathered from the following list:—

Prevailing Color.	Color 1.	Color 2.
Leaf-green.	Pistachio-green.	Bluish-green.
Sienna-brown.	Greenish-yellow.	Reddish brown.
Pale red.	Rose-pink.	Salmon.
Dull violet.	Pale umber.	Almandine red.

It may be imagined what a play and variety of hue is shown by properly cut specimens of tourmaline when the same stone, as it is turned about, sends out from the same facet first a greenish yellow, then a brown, and lastly a brownish-red beam of color. From other facets come simultaneously all these hues, which are the more widely different from one another in the case of the tourmaline, because this stone enjoys beyond all others the polarizing power. Indeed, a green tourmaline, when viewed from end to end of the crystal, along and not across the principal axis, is often absolutely black and opaque to light. In order, however, to develop its dichroic effect to the full, it is a good plan to give the cut stone somewhat the form of a brilliant, that there may be a greater fluctuation in its hues. And here it may be proper to remark how great a mistake is made by a clique of writers on art who deprecate the cutting or rather faceting of precious stones and would have them all, without distinction of species, made tallow-topped or *en cabochon*. The inherent characteristic qualities of the stones of the second group can be developed only by a plan of cu ting in which small planes suitably disposed as to angle, shape, etc., form surfaces for the reception and emission of the incident light. Thus alone can the refraction, pleochroism and surface lustre of these gems be shown to perfection.

We must not give an exhaustive account of the other gems of this group, but we cannot refrain from mentioning the zircon or jargoon, a somewhat neglected precious stone, though it is interesting from many points of view, and is, moreover, often very beautiful. It is hard; its surface-lustre and refractive power give it a brilliancy and fire second only to that of the diamond, and it is singular on account of its composition, for it contains the rare element zirconium, present in no other gem. Moreover, its weight or specific gravity, between 4½ and 5 times that of water, is greater than that of all other precious stones. Its range of color is extensive, while some of the hues it presents are peculiar to this stone. A pale sepia hue lighted up by prismatic fire is very beautiful, so also is a clear yellow like transparent gold, with the faintest tinge of opalescence within it. Many of the colors shown by the jargoon or true jacinth may be lightened or discharged by heat, the aurora-red from Espaly, in France, and from Mudgee, in New South Wales, being specially susceptible of such change, becoming straw-yellow and gaining in brilliancy. Other kinds, as the greenish stones from Ceylon, become paler when strongly heated, shrinking at the same time so as to acquire an increased specific gravity. This constitutes another interesting feature in the history of this stone, and so also does the singular series of black absorption bands which many of the Cinghalese and other zircons exhibit. These black bands interrupt the continuous spectrum of a beam of light transmitted through the stone, and indicate that it is opaque to rays of certain degrees of refrangibility.

We must not dwell on the color characteristics of the stones which belong to our third group. The *chatoyant* effect seen in the true or chrysoberyl cats-eye, a floating line like a silver wire, is due to an internal reflection of light arising from the minute structure of the substance of the gem itself. So also is the white beam of the moonstone, or adularia, a variety of felspar. In the softer cats-eye we have threads of asbestos or other minerals, and sometimes even the spaces they have left, regularly arranged in transparent quartz and reflecting the light from minute parallel striæ. In star-sapphires and rubies a combination of minute striæ with a structure formed of six triangular prisms forming the hexagonal crystal gives rise to a six-rayed star, the centre of which lies in the intersection of the three secondary axes with the primary axis of the prism. Of the opal with its internal fissures too minute to reflect the complete ray of white light, and so breaking it up into the hues of the rainbow; of the soft sub-translucent blue of the turquoise, and of the hues and textures of the chalcedony, the onyx, and a multitude of other beautiful or curious stones we must refrain from speaking now. We trust that enough has been already said as to the color of gems to justify to some extent the estimation in which they are held, and perhaps to render that estimation more intelligent.

Art in Metal.

By J. Hungerford Pollen, M. A.

METALLURGY means the art of smelting and preparing metals, and working them into objects for use or ornament. The art, in one form or another, is as old as human society. The Scripture speaks of Tubal-Cain as the father of metal-workers. Pliny, the natural historian, calls Lindus of Scythia the earliest known smelter of metals. Many archæological collections contain tools and weapons, some considered to be of pre-historic antiquity. All authorities agree that it is the earliest art on record.

The most primitive examples of metal-work we know of are of alloyed metal, generally copper, tin, and other metals variously mixed. One of the countries from which these materials were first obtained, in bars or ingots, and probably also made up into various utensils, was our own. The Phœnician merchants, the earliest navigators of whom we have any record, sailed through the Straits of Gibraltar, coasted round Spain and Gaul, and traded with the British tribes of Cornwall, Devon, and the Scilly Islands. They brought tin—perhaps also copper, and alloys of both metals—from those coasts to the cities and states that bordered the Mediterranean basin. Copper is a metal of very wide geological distribution—the island of Cyprus has its name from the Greek word *kupros*, copper, which abounded there—but tin was more difficult to get. The two metals, when alloyed or mixed together, make the Greek *chalchos*, Latin *æs*, which is sometimes translated, brass, but is more properly, bronze—the metal in general use by the ancient nations. What we call brass is an alloy of copper and zinc, a beautiful metal, but not so hard as bronze. The color of bronze is a rich golden brown, varying according to the proportions of the metals composing it, usually from eight to twelve per cent. of tin. Other metals, in small quantities, were used in some kinds of bronze; sometimes, no doubt, because found in one or other of the two component materials, from which they were not removed in smelting; sometimes added purposely, in order to improve the color or the quality and fusibility of the alloy.

The earlier smiths and artists made most of their bronze-work with the hammer. They had admirable methods of tempering the alloy. The furnaces of the ancients were heated by wood or charcoal, and the metal was slowly smelted, so that it was tough and dense. If allowed to cool slowly it became very hard, if more quickly it would be softer; and, as some bronzes would have small quantities of other metals in them as well as tin, the workman could keep some for tools, knives, daggers and swords, and other kinds for

armor or ornaments. All sorts of tools for working wood or metal, as well as arms of every description, were made of bronze by the Egyptians, the Assyrians, the Hebrews, and the Greeks. The British Museum, the Louvre in Paris, the armory of the Tower of London, and many other collections contain good examples. Sword-blades were hammered to the sharpest cutting edge, the metal being laminated and tempered so as to be equal to good iron and steel. Two beautiful shoulder-pieces, representing Amazons and Greek warriors, part of a suit of armor, may be seen in the British Museum. They were found in Italy in 1820. The metal is as thin as paper, but exquisitely modelled and tempered. It has, perhaps, lost much of its thickness by time. According to Sir G. Wilkinson, Egyptian arms and tools of admirable hammering have been found of the date of 1800 to 2000 years B. C. Axe-heads and various other weapons have been excavated at Troy, by Dr. Schliemann, at a great depth below the surface of the ground, and may be of the date usually given to the Trojan War—eleven to twelve centuries B. C.

Mr. Layard discovered various utensils in Nineveh in which the bronze had an inner core of iron, and were slighter and stronger than if they had been made of the former only. We believe these are rare examples.

Besides tools, arms and armor, these ancient nations made much of their furniture, thrones, beds, and other things not often moved about, of bronze. An infinite variety of small objects, such as buckles clasps, ornaments for the harness of horses and carriages—for shields and dress and accoutrements, not themselves made of metal, were of bronze-gilt—and wooden chairs, couches, and other furniture had pins, knobs and ornamental pieces, not to speak of hinges and locks, of bronze.

According to Mr. Layard, much ornamentation, called generally gilding, was done at Nineveh by thin plates, or by washes of the dust of this metal.

Hitherto we have treated of metal-work executed on the anvil by hammering. There seems no evidence that casting bronze was practised till long after the Greeks had become great and powerful. The means for treating large masses of molten metal were wanting. Even in smelting it, probably only small quantities of it were produced at a time. A curious female bust of hammered work, with sphinxes on the base that supports it, is preserved in the British Museum. A hammered statue of Jupiter, by Clearchus of Rhegium (in Italy), is said to have stood near the temple of Minerva, in Sparta.

Glaucus of Chios, in the seventh century, B. C, is said to have invented soldering—*i. e.*, uniting bronze by means of softer metal which is easily fused, and fastens two pieces as by glue or cement The early Tuscan metal-work, of which there are examples in the British Museum, shows no trace of this method. Plates of hammered bronze could, by means of soldering, be made into statues of the size of life or larger. And the practice of casting came into use (invented, it is said, by Theodoros and Rhoecos) about the same time. It is to be observed, however, that the great sculptors made statues great portions of which were of hammered gold, also in plates, riveted to each other over a core of wood. We shall speak of some of these works later.

All the bronze-workers of antiquity seem to have been accustomed to ornament their productions with gold and silver. They did this in several ways. The simplest was to gild it all over or on parts. Gilding was executed during these ages as it is now. Mercury, or quicksilver, has an affinity with gold, with which it forms what is called an amalgam. In this state it is laid over the metal to be gilt, and the whole is baked in an oven or heated chamber in which the mercury is evaporated, leaving the gold firmly united to the bronze. Another method of decoration was that to which we give the name of damascening, or inlaying in patterns with small quantities of solid gold and silver. This process has continued common in India and the East generally, and is practised with extraordinary skill and much beauty by the Japanese. In damascening, a design or pattern is traced on the surface of the hard metal, and dug out carefully with a tool, leaving the bottoms of the channels rough. Into these hollows a wire of pure gold or silver is hammered, so that it fills the space and takes firm hold of its rough sides. The gold or silver is often left of some thickness above the bronze surface, and it is then modelled by the hammer and graver as the artist chooses. Another method of damascening on softer metal is to dig out slightly the lines of a given design, to lay thin gold or silver leaves in them, and to hammer down the rough edges of the plates, and so fasten them firmly to the ground. Or, again, gold and silver are sometimes let into holes of such thickness as to require to be fastened firmly into the solid metal by pins or plugs of gold or of silver. All these methods seem to have been in use amongst ancient nations.

In treating of casting, we should remember that small ornaments, and, perhaps, some tools and instruments, were probably at all times made by casting; but casting on a large scale was not in use till the age of the great Greek sculptors. The earliest cast statues were of solid metal; but when sculpture in bronze came to be more widely practised they were cast hollow, and in the following manner:—A model is first prepared round a core made of clay, pounded brick, and plaster of Paris, or other such substances, strengthened with bars of metal. Over this the artist works his model in tempered wax, an inch in thickness. Round the wax image a mould is made up of plastic clay-sand, such as will stand the heat of melted metal, and which is fine enough in texture to take the impression of the most delicate lines and surfaces of the wax. As soon as the mould is hard it is baked in a furnace, and the melted wax allowed to escape through holes prepared for it. In this way the mould remains entire, and an absolute counterpart of the artist's work. The molten metal is then poured into the mould, and allowed to cool gradually. Lastly, the sculptor finishes his work with the graver. In this process there has, probably, been no variation from the time of the ancient Greeks to the Renaissance.

The treatment of bronze in this simple manner put into the hands of sculptors a means of working up their conceptions with a common wooden tool in a material so soft, and yet so tenacious as wax, and afterwards of producing the same figure in a metal that can be finished to the utmost delicacy of surface, and that does not corrode with time. A great period of art was at hand. The reign of the famous sculptors of Greece began. The master or trainer of the greatest of these sculptors was Ageladas of Argos. From his school came Pheidias, Myron, and Polycleitus. His date is the latter part of the sixth and the first year of the fifth century B. C., and his great pupil Pheidias lived through most of the fifth. All these artists worked in bronze as well as in gold and silver. In the British Museum the reader may see the frieze, metopes (or sculptures of the entablature), and the figures that filled the two pediments of the Parthenon, the temple of Minerva, in Athens. These are the work of Pheidias and his pupils in marble. Nothing in metal-work by his hand has survived the sacks and plunderings of the capital cities of antiquity. The Romans carried away his bronze statues for the sake of their beauty, and the Huns and tribes of northern Europe broke them up for the value of the metal. We can, however, form a judgment of what these works must have been from what we see in marble. The marble statues and groups, which have been unburied in Rome and various parts of Italy, and which form the glory of modern museums of sculpture, are generally considered to be models or copies of some of these famous works. The quantity of statues alone made by the Greeks was enormous. Three thousand statues, most of them in bronze, are said to have been preserved in Delphi, and as many in Athens and in Rhodes.

The temples of Greece of the date of Pheidias had many ornaments, such as the crests or finish of the pediments, ornamental gratings, doors with decoration on them in relief, of bronze and gilt. The treasuries of great shrines, or places of special religious resort, contained (besides other precious objects of which we do not treat at

present) chariots, candelabra, and offerings in a hundred shapes, of bronze—cast, tooled and chased. In Athens a street was known as the "street of tripods," from the range of altars of bronze gilt kept in it. Pheidias, besides his skill in statuary, used to make bees, flies and small animals, and other objects in gold, silver, bronze, inlaid and damascened, which he finished with the utmost delicacy.

Perhaps we can trace the sort of small work in which these great artists took such pleasure in some of the delicate inlaid bronze-work of the Japanese. These objects were finished with chasing, and, very probably, with many metals and bronze of various alloys and tones of color.

It is probable that many of the bronze statues of antiquity, perhaps most of them, were gilt, and the gilding would preserve the bronze from the green "patina" or rust which forms on it when buried *for a very long time.*

Comparatively few ancient Greek bronzes remain. Antique bronze statues of the Etruscans, a people of Eastern origin, who held the centre of Italy till late in the history of Rome, are to be found in the galleries of Rome, Florence, Paris, and other capitals. In the British Museum, for instance, the reader will see several small figures, vases, chests and other vessels, with sculpture and chasing upon them of old Etruscan or Greek workmanship. Of small objects by which we may judge of the grace and skill of Greek and Etruscan metal-work we have none so numerous, so well-preserved, and of such excellence, as the mirror cases or covers. These have been found in large numbers in many parts of Italy, and can be seen in most large public collections of classic antiquities.

The period of this great excellence in sculpture, as well as of other art, did not last long. The immediate successors of the artists named maintained an astonishing skill in metal-work, especially in jewelry, gold and silver vessels, drinking cups, and other utensils; of these artists and their productions we must treat at a future time The genius and power for conceiving vast groups and compositions, and colossal statues, cannot outlive the great men with whom such gifts are found under certain happy conditions of time and opportunity. The schools founded by them, however, last long, and produce scholars and workmen who have a wonderful skill, great copyists and imitators, and often admirable designers of sculpture and other kinds of art on a small scale. Such was the case with the schools founded by the sculptors in metal and marble in what we have spoken of as the great age of the Greeks. Many names belonging to it have come down to us. Only the very greatest are here named, but there must have been thousands of whom there is no record whatever. The great age may be said to have passed away with the death of Alexander.

Communication.

PHILADELPHIA, June 25th, 1878.

To the Editor of the JEWELERS' CIRCULAR:

SIR:—In the June number of the JEWELERS' CIRCULAR I read for the first time, though it is dated March 26 of last year, a letter by Mr. Alfred H. Potter addressed to Mr. Ed. Favre Perret.

Mr. Potter takes exception to certain statements made by Mr. Perret in a speech delivered at "Locle," over a year ago. This speech has been so generally published throughout the world that the effect has been to advertise American watches, and give to them the same celebrity abroad they had previously enjoyed at home. And he protests against the American Watch Companies using this speech to publish their wares, by which, as he says, "reflecting discredit and bringing ruin upon an industry of which Switzerland, above all other countries, has a right to be proud." It is scarcely worth while to discuss whether the American have the same right as the Swiss to advertise their wares, but when he volunteers the assertion, that a watch is made in Switzerland which cannot be made in the United States for want of "the proper facilities" and the "indispensable skilled labor," I must beg leave to offer my protest. I do not know what proper facilities Mr. Potter refers to, but as to the indispensable skilled labor, I do know, if Mr. Potter does not, that it is to be found in perfection and abundance in this country, and with it, what is not so common elsewhere, *brains*, while in machinery we are so far in advance of the rest of the world that to institute a comparison would be very difficult. I have conversed with watchmakers from London, Coventry, France, Germany and Switzerland, and they have not only admitted our wonderful superiority in that respect, but despaired of ever being able to compete with us.

In 1876, during the Centennial Exhibition, the watch stand of the Waltham Company was surrounded daily by the representatives of watch manufacturers of every nationality, among them doubtless some of the skilled workmen from Switzerland whom Mr. Potter delights to honor. These men were loud in their praise of what they daily witnessed, and a very intelligent German who saw a young girl make, polish and finish a pinion in less time than I can write it, said, if he stated that fact in his own country he would not be believed. Many of the men remained in this country and engaged themselves in our watch factories to get some knowledge of the machinery of which they were so lamentably deficient. Why, take for example the jewelry of a watch. It was formerly considered a good day's work for a workman, and he had to be a good one, too, to jewel one watch. Now any man of ordinary ability, with a "Stark" lathe, can do a dozen. All this could not fail to have impressed those who visited our Exhibition, and when Mr. Favre-Perret made his famous speech at Locle he was borne out by hundreds who knew from what they had seen that what he said was true. Granted, that Geneva has the "choicest kind of machinery," "immense water wheels" and "water engines"—"many of which are wonderful specimens of ingenuity," and it is pleasant to know that they "do their work silently and faithfully, and then exhibit to the world their products." That is just what American machinery has done and is doing, and so successfully that the papers now announce the sale of every watch in the Waltham exhibit in Paris. Under these circumstances we can afford to pass by the remarks of Mr. Potter on the advertising American Watch Companies—"Patent Quack Medicine style," though if it were worth while I might say something about the Swiss in this particular. But this I will say—when one buys an American watch he is likely to get what it is represented to be, and not some cheap manufacture with a celebrated Swiss or English name upon it.

And now one word on hairsprings (isochronism), and the adjustment of watches by "enchantment," which seems to have so exercised Mr. Potter. What Mr. Favre-Perret did say, as his speech is reported, was this: "They arrive at the regulation of the watch—so to say, without having seen it. When the watch is given to the adjuster the foreman delivers to him the corresponding hairspring and the watch is regulated." What he meant to say was, that when the balance-wheel is completed, from its size and weight, the spring is constructed of accurate strength, etc., without the spring maker having seen the balance-wheel. If any watchmaker wishes to verify this statement, let him send to Bottom, of New York, the *weight* and *size* of a balance-wheel, and he will receive in return a spring suitable in every respect. How this result is arrived at it is not my business nor have I the time to explain to Mr. Potter, but like other discoveries and improvements made by the American Watch Company during its short existence, as well as its improved machinery, it is no secret, and open to the world. The adjustment of the watch to heat and cold and in positions is another thing, and the American Watch Company never claimed to arrive at it by "enchantment."

There are other parts of Mr. Potter's letter I would like to notice, as they contain many misstatements, but it would require too much space to expose them all. To be brief, then, I deny "that Switzerland has always been, or is now, sending such goods as cannot be made in any other country at any price." I deny, "that a medium grade Swiss watch will compare favorably with the highest cost watch made in America," or even with a medium grade watch made in America. I admit, that the American watch is *finished* by machinery, which machinery does its work with an accuracy that cannot be excelled by any skilled workman. I admit, that the work on a Swiss watch commences where the machinery leaves off, in many cases its accuracy to be destroyed by the imperfect work of the hand. And I deny all that Mr. Potter asserts about the comparison between the medium grade Anchor escapement Geneva watch and the highest grades of American manufacture.

Mr. Potter's letter is dated from Geneva, where he went, as he says, to learn now to make a watch. He says, too, he has been connected with the watch business for twenty-five years, and is familiar with American watch manufacture in all its details. I confess I doubt the latter part of this assertion, and I think it would pay him to visit the Waltham factory, where he would find he has still much to learn. I too have been connected with watchmaking for twenty-five years, have worked in one of the most celebrated establishments in London, and am familiar with the best work made there, as also in Switzerland and Germany. I have seen their best machinery and skilled labor and award them all due praise. But when compared with the exquisite machinery, workmen and *brains* of this country, and the wonderful progress made during fifteen years against one hundred and fifty, I cannot but differ with Mr. Potter in his estimate of American machinery, labor and watches.

LOUIS C. GROPPENGIESSER, 131 S. 13th St., Philadelphia.

Trade Gossip.

A fire at Edwards, Miss., a few days ago destroyed McCain's jewelry store; loss, $20,000.

The Ansonia Clock Co. is about to introduce a series of horological novelties that will astonish everybody.

During the month of May the United States Assay office of Helena, Montana, melted $68,291.70 of gold and silver bullion

The jewelry Store of Alfred Becker, in Syracuse, was recently entered by burglars, and a large amount of jewelry stolen.

A silver brick, encased in California woods, is to be the tribute of British residents of San Francisco to Lord Beaconsfield.

A jeweler in the Paris Exhibition shows a necklace which purports to be a mixture of true pearls and false, and challenges anybody to single out the real.

The pickpockets say that if the religious newspapers and quack medicine dealers don't stop flooding the country with cheap *chromo* watches their business won't be worth a cent.

The house and outbuilding belonging to Mr. James Fricker, of Americus, Ga., were destroyed by fire on the 4th inst. His loss is estimated at between $4,000 and $5,000, insured for $3,300.

Mr. Thos. Kirkpatrick, a jeweler who used to make Americus badges of splendor in the halcyon days of Tweed, sues the city for $2,000, being the price of clocks furnished in 1869, 1870 and 1871.

The fact that the immortal Washington never told a lie does'nt seem so preposterous after all, when you bear in mind that making 14 karat chains out of 10 karat gold was not much of a science in those days.

A Nelliston genius has invented a pair of spectacles which enable the wearer to see behind as well as in front. If Mrs. Lot had worn one of these invaluable glasses, that pillar of salt would never have seen the light.

Mr. S. E. Thomas, of the Seth Thomas Clock Company, is making an extended tour through Europe. After doing England and the Continent he will visit Russia, Norway and Sweden, and then bend his steps homeward.

It is said that Montana, with a population of 50,000, has not a business failure in a year. This circumstance is said to be due to the custom of hanging those who are unable to make satisfactory arrangements with creditors.

The Seth Thomas Clock Company has recently received an order for 1,500 of a particular kind of clocks per month, and as its present capacity is but 1,000 to 1,100, the Company will be obliged to increase its manufacturing facilities.

Mrs. Jones (looking at the exhibit of American watches)—"Good gracious, Monsieur Gordong! Six o'clock already! How quickly time flies." *Monsieur Gordong*—"That is a proof, my dear Madam, of the rapid progress of American horology."

The composition of Tula silver, which was long kept a secret, has at length been discovered. It consists of nine parts of silver, one part of lead and one part of bismuth. The metals, in the proportions stated, are melted together, and when saturated with sulphur the alloy takes on a beautiful steel-blue tint.

The sum produced by the recent sale in Paris of M. Castellani's collection of porcelain is mentioned by *Galignani* as "more than 406,000 francs." A round dish having on the bottom a figure of St. Mark, a book on which a lion places its paw, and the monogram G. P., which formerly was part of the famous Medici porcelain, brought 10,000 francs.

Henry Ketterer, a manufacturing jeweler, recently arrived in this city from Colorado to consult an oculist. Not receiving much encouragement in regard to his complaint, he became despondent, and a few days ago committed suicide by shooting himself. His wife says that she knows of no other reason for the commission of the act other than that above stated. Mr. Ketterer is fifty-seven years of age, a native of Switzerland and well known in Western cities.

A fashionably-dressed man went into Hunt & Roskell's large jewelry store, in Bond Street, London, selected articles worth $4,000, and tendered a thousand pound note in payment. Mr. Roskell ascertained that the note was a forgery. Just as he was about to summon assistance, a cab was drawn rapidly up and two men in police uniform hurriedly entered, saying that the man was an old offender of whom they were in search. Directing a porter to place the jewelry in the cab and to come along with them as a witness, the men in uniform said that they would inform the firm when their attendance would be required to press the charge. Then they drove off with their prisoner, leaving the jewelers loud in their praises of the proficiency of the police. Next day, however, their porter, brutally beaten, returned with the information that the two supposed police officers were thieves in disguise.

Novelties in Jewelry, etc

Monogram fans is the latest agony.

Classic designs in jewelry continue to be fashionable.

Tortoise-shell bangles, with tiny tinkling bells, are new.

Reproductions of designs from the Castellani Collection have met with great success.

"Real" looking butterflies with the natural colors in enamel are used for hair ornaments.

Young ladies wear for a necklace a band of black velvet, to which are attached tiny tinkling bells.

Greek circlets of tortoise-shell, bound with gold, are novelties in fancy goods, to be worn on the hair.

Diamonds set in black onyx, pearls in onyx, Whitby jet cut in cameo, and finely carved bog-wood is worn.

A sunshade composed entirely of pansies, with a solid gold handle, is a novelty exhibited in a Broadway window.

Bangle necklaces passing over the head in the same way that bangle bracelets do over the arms, are among the novelties.

A new pin or brooch for ladies is the imitation of the fasces of a Roman lictor, with the axe and thongs in burnished silver.

The latest design for a scarf-pin is unique. It looks like a Mexican tarantula with a double set of wings, and is called a "darning-needle."

Sleeve links are again in fashion in place of the solitaire cuff-buttons, but they are made of two dissimilar ends, instead of alike, as formerly.

Silver filigree, real and imitation, is selling in a variety of ornaments. A new necklace in this work has jet set in the band and jet drops.

Dainty little cups and saucers, designed by the Meriden Company for its Brazilian trade, are in French steel and gilt, and beautifully decorated.

Black pearls set in dead gold are the latest style of scarf-pins for gentlemen. The bridegroom now wears a wedding-ring as well as the bride.

New English necklaces in silver and gilt are made in the snake-pattern, and the ends overlap and are fastened together with a strap and metal buckle.

One of the oddest designs for gentlemen's scarf-pins is a bird's claw with the feathers still on. The leg is of gold and silver, and a jewel is set in the top of the claw.

Some of the Italian and Norwegian ornaments in fancy stones in real silver filigree are very handsome. A pin represented a daisy, with the centre of the flower gilded and the rest silver. Another is a carnation.

A beautiful flower-holder is in the shape of a cross and crown. the latter is attached to the arms of the cross, and holds a glass vase; the bottom is in repoussé work, with tiny silver birds perched at the foot of the cross.

A square umbrella is one of the novelties in London. Square buttons are among the trimming novelties, but, being difficult to manage, are not likely to be popular, although many are handsomely carved and tinted.

Very high Spanish tortoise-shell combs, with richly carved traceries between medallions ornamented with antique heads, or with carved bees and flies, with golden legs and antennæ, are among the Neapolitan shell goods seen in fancy stores.

An oval box is covered with white corded silk, clasped with silver, and ingeniously covered with twisted tinsel in rainbow tints; within is a flower-piece — roses, forget-me-nots, stephanotis and ferns—painted on blue silk. It is trained in oak-leaves of silver on the top.

Bulgarian silver ornaments of a quasi-Greek form are offered to buyers in the bazaars of Stamboul with the assurance that they are of great value, owing to their antiquity. Several English firms sent out agents to pick them up, and many of them have returned nicely fleeced by the guileless speculating Turks.

Bangles have almost entirely disappeared, but bracelets are quite generally in vogue. Plain chains of gold in pairs are worn with plain toilets. Serpent bracelets are fashionable, and are made of enameled and tinted gold, with jewels for eyes. The skillful workmanship displayed in serpent bracelets does not by any means render pleasing the style which winds around the arm from ten to a dozen times.

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THE

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THE

Jewelers' Circular & Horological Review.

THE RECOGNIZED ORGAN OF THE TRADE.

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☞ *All communications should be addressed,* D. H. HOPKINSON, *No. 42 Nassau Street, New York.*

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The Jobbers' Convention.

ON the 1st day of June last, an important meeting of the jobbers was held at Chicago. In addition to representatives from all the leading jobbing houses of Chicago, there were present several other gentlemen largely interested in the Western jewelry trade, and also representatives from several of the Watch Companies. The call, in pursuance of which this meeting was held, stated that the object of it was to consider the recent changes in prices of silver watch cases, and to adopt measures calculated to re-establish uniform prices at which all jobbers would agree to sell. At this meeting the subject was discussed in all its bearings, and finally a committee was appointed to communicate with other Western jobbers with a view to securing their co-operation. Several adjourned meetings were held, and it was finally resolved to call a Convention of all the jobbers of the United States, to be held in New York, on the 23d of July.

The call sent out for the New York meeting was wider in its scope than had evidently been contemplated by the Chicago gathering, inasmuch as it stated that the object of the meeting was "the consideration of any and all subjects which are of common interest to the trade."

The New York meeting was held as suggested, on the 23d of July, adjourned sessions following on the 24th, 25th and 26th. These took place in the office of Safford & Fornachon, the jobbing trade being well represented. Among those present were—

Mr. Muhr, of Muhr's Sons, Philadelphia; Mr. Young, of W. B Clapp, Young & Co., Chicago; Mr. Preusser, of C. Preusser & Bro., Milwaukee; Mr. Chas. Wendell, of Chas. Wendell & Co., Chicago; Mr. H. F. Hahn, of H. F. Hahn & Co., Chicago; Mr. Benj. Allen, of Benj. Allen & Co., Chicago; Mr. Ira Canfield, of Canfield Bros. & Co., Baltimore, Md.; Mr. Flershem, of Lapp & Flershem, Chicago; Mr. Alford, of C. G. Alford & Co., Mr. J. T. Scott, of J. T. Scott & Co., Mr. Stern, of Stern Bros. & Co., Mr. Freund, of Max Freund & Co., Mr. Runkle, of L. Hammel & Co., Mr. Marx, of Kossuth Marx & Co., Mr. Jos. Fahys, Mr. Untermeyer, of Keller & Untermeyer, Mr. Keller, of Pforzheimer & Keller, Mr. Adler, of L. Strasburger & Co., Mr. Wheeler, of Wheeler, Parsons & Hayes, Mr. Herzog, of L. Herzog & Co., Mr. Middleton, of Middleton Bros., Mr. Cross, of Cross & Beguelin, Mr. Colby, of Colby & Johnson, Mr. Hirsh, of Hirsh Bros., Mr. Aikin, of Aikin, Lambert & Co., Mr. Dinkelspiel, of S. B. Dinkelspiel & Co., Mr. Stern, of May & Stern, all of New York; Mr. Fitch, of American Watch Company, Mr. Baxter, of Elgin National Watch Company, Mr. Fleming, of Illinois Springfield Watch Company, Mr. C. D. Rood, of Hampden Watch Company, Mr. Wilcox, of Courvoisier, Wilcox & Co., Mr. Dueber, of Dueber Watch Case Company, Mr. Evans, of Jacques Laurent.

Mr. Ira Canfield, of Baltimore, was called upon to preside, and Mr. C. G. Alford, of New York, was chosen Secretary.

The first question brought up was that relating to silver cases, it being thought feasible to secure uniform prices for cases as there is for movements. A variety of propositions were made, but, it being conceded that the jobbers could do little without the co-operation of the case and movement manufacturers, a committee of five was appointed to confer with the manufacturers and ascertain if they would sustain the jobbers in their efforts to secure uniform prices.

On the following day this committee reported that they had had a full and free discussion with the following named case and watch makers: Messrs. Joseph Fahys, Dueber, Wilcox, of Courvoisier, Wilcox & Co., Evans, of Jaques Laurent, casemakers; E. C. Fitch, of Robbins & Appleton, Baxter and Wooley, of Elgin National Watch Company, James Fleming, of Springfield Illinois Watch Company, and Charles Rood, of Hampden Watch Company. There was a general desire expressed by all that an understanding should be reached which should be binding upon both the manufacturers and jobbers, and suggestions were made: 1st. That makers of silver cases and manufacturers of movements and jobbers of the same agree with each other not to sell silver cases to the retail trade below prices to be mutually agreed upon. 2nd. That to make said agreement effectual said case and movement manufacturers agree that they will not sell parties violating this agreement, directly or indirectly; and the jobbers agree that they will not buy of such manufacturers as do not sign such agreement. And in cases where proof conclusive is presented, the said manufacturers agree not to sell such violator of such agreement.

The report having been accepted, a discussion arose as to who were to be considered jobbers. It was complained that men doing a retail business exclusively were recognized by the manufacturers as jobbers, and furnished with goods at jobbers' prices, thus cutting into the business of men who had large sums invested in the jobbing trade. It was also asserted that men who traveled about with a sample trunk, showing movements and cases, and selling by sample, had no right to be considered a jobber. Some of the watch manufacturers participated in the discussion, alleging that one of the greatest obstacles they found in business was to define who were jobbers and who were retailers. It was their desire to protect both interests, and they would be glad to see the line of demarkation clearly and definitely drawn. It was asserted that men claiming to be jobbers were frequently found soliciting a retail trade, offering their goods at even a less price than the retailer had to pay for them, while in other instances certain retailers were larger buyers than some of the jobbers.

The debate was participated in by a majority of those present, and finally a committee of five was appointed to confer with the case and movement manufacturers in order to solve the important question: "Who shall be considered jobbers?"

The committee appointed reported at the adjourned meeting on the 26th, that they had met the representatives of the several watch companies, and an understanding reached which seemed to be satisfactory. That agreement was, in brief, that the American and Elgin Watch Companies would recognize as jobbers such dealers as purchased at least $2,500 worth of movements a year; no one to be recognized as a jobber who bought less than $500 worth at his first purchase from either company. No jobber to sell to another jobber at less than 5 per cent. advance trom cost. Parties so recognized to be entitled to best rates from the Springfield Illinois Watch Company, and the Hampden and Howard Watch Companies; but a jobber buying from the latter Companies must purchase $200 or more at first purchase, and not less than $1,000 a year, to be recognized by the Companies first named; jobbers not to retail at less than an advance of 20 per cent. advance from regular rates to retailers, or 10 per cent. advance from the Waltham list. This last proviso is intended for the protection of the retailers; and, if rigidly enforced, as we are assured it will be, it will put an end to the complaints so freely made regarding the invasion of the retail field by the jobbers.

The report having been read and discussed section by section, was unanimously adopted. A committee of five was then appointed to see that the spirit of the Convention is carried out, and the Convention adjourned *sine die*.

This action of the Convention is important to the trade in many respects, and, if honestly carried into effect, cannot fail to be productive of beneficial results. It is undoubtedly true that both manufacturers and jobbers have heretofore been conducting business in direct opposition to the spirit of the agreement now arrived at, the manufacturers selling directly to the retailers, and the jobbers trenching upon the field of the retailer. While the manufacturers recognise the jobbers as necessary to the successful conduct of their business, they are determined, at the same time, to protect the rights of the retailer. It would be impossible for the manufacturers to successfully conduct their business without the intervention of the jobber. The number of retailers is so great that the manufacturers would be totally unable to sell to them individually. The jobbers come in virtually as their agents, each having his own territory to operate in, and his line of trade to cater to. He is also a great convenience to the retailer, inasmuch as he carries a full line of goods, of different manufacturers, from which the retailer may choose, instead of being at the trouble and expense of consulting each manufacturer in turn. The special prices allowed the jobber afford him but fair compensation for the capital he invests and the expenses he incurs in carrying the goods of so many manufacturers for the benefit of the retailer. By the proposed arrangement the jobber is protected by the special rate given him, the manufacturer concentrates his business, through their agency, within reasonable limits, while the retailer is protected against the invasion of his territory by the jobbers, by the penalty provided for the jobber who seeks to retail, viz.—the cutting him off from the privilege of buying at jobbers' rates.

Throughout the entire discussion, the manufacturers have sought to obtain a fair and equitable solution of the questions which have vexed the trade, and have shown a disposition to protect the retailer in the legitimate prosecution of his business. Their complaints have heretofore been as loud against the jobbers as the jobbers' against the manufacturers. The former have been frequently accused of flooding the country with enticing circulars, offering goods at retail at jobbing prices, and the CIRCULAR has had frequent occasion to denounce the practice. The agreement above recited will put an end to all this, if fairly lived up to, and the CIRCULAR will not hesitate to denounce in vigorous terms any one who may violate it. The line of demarcation, between the varied interests involved in the manufacture and sale of watches, is very clearly drawn, and there is no reason why these interests should not work harmoniously together in the future. Each phase of the business is necessary to the other; each has its well-defined boundaries; there is no necessity of their clashing unless one deliberately trespasses upon the rights and privileges of the other.

Since the Convention of jobbers adjourned, there have been several consultations of manufacturers, whereat they have determined to rigidly adhere to the agreement entered into, and to enforce the penalties provided, should there be any violation of the compact. This agreement specifies the minimum rates at which jobbers may sell goods to retailers. Jobbers, as we have said, are recognised as necessary to both manufacturers and retailers, but the retailers are of so much more importance, that the manufacturers will not hesitate to cut off the jobbers whenever they attempt, by underselling, to injure the business of the retailers. As middlemen they have their uses and a legitimate sphere to operate in, but, when they attempt to consume the substance of both the producer and consumer, as they sometimes have done in the past, both classes whose rights are invaded, must rise up against them.

After the adjournment of the Convention, the Committee appointed to advise the trade of the proceedings had several meetings with the movement and case manufacturers, with a view to perfecting the details of the agreement. This was done in a perfectly harmonious and satisfactory manner, and a circular issued to the trade reciting the facts substantially as set forth above. As to prices for silver cases, it was determined that the American Watch Company's price-list should govern in the future. From the spirit which characterized the gentlemen who participated in the proceedings, from first to last, there is little doubt but the recommendations of the Convention will be accepted as the rules whereby the trade is to be governed in the future.

We are of the opinion that the Convention has been a means of working great benefit to the trade in general. The cut-throat game so long indulged in has been unprofitable to all concerned, and there appeared to be a universal desire to find a remedy for the evil. The utmost harmony prevailed among all the gentlemen present, and there seemed to be but one desire entertained by them, and that was to secure a fair and equitable understanding that might apply to and govern all. That understanding was reached, and, so far as we can judge from the expression of those present, it is their determination to live up to it.

American Plated Ware in Europe.

THE *Jeweler and Metalworker* of London, England, sends forth a warning to the electro-plate manufacturers of Europe, notifying them that goods of American manufacture are rapidly finding a place in their markets. It speaks very highly of the originality of the designs which characterize the American work, which commend them highly to purchasers. It also commends the enterprise of our manufacturers in letting the world know what they are doing, by sending out their pattern books freely, advertising largely, and illustrating their new designs with well-executed artistic wood-cuts. This display of enterprise, so foreign to European manufacturers, is commended to them for imitation, as, in fact, a necessity if they expect to hold their own in the markets of the world.

All this is very complimentary to the taste, skill and workmanship of our designers and manufacturers, and is another illustration of the fact that this country is no longer dependent upon the old world for either artists or artisans, while in business tact, energy and push we lead the world. Not only have our goods challenged competition in the very home of artistic skill and fine workmanship, but have invaded the outside markets heretofore controlled almost exclusively by English manufacturers. We hear of quite a number of very satisfactory orders for electro-plated ware and jewelry having been received by

our manufacturers from South America, Australia and New Zealand. The novelty and excellence of American designs especially commend the goods to the foreign trade, while the material and workmanship are admitted to be second to no other. When our manufacturers become fully convinced that the trade of South America and the outlying British Provinces is desirable for Americans to have, there will be little difficulty in securing it.

But it is the business characteristics of the Americans which especially excite the wonder of our English cousins. The stirring activity which animates us all, the pushing and driving, the constant seeking for new avenues of trade, the incessant dinning of business into the ears of the world, from morning till night, without rest or let up, is what they cannot understand. As a rule, European business men are content to devote three or four hours a day to business, and their artisans are overworked if they put in more than eight or ten hours a day. Here it is entirely different; our business men work twenty-four hours a day and complain then of a lack of time in which to do all they want to do. They are not happy unless their factories run night and day, and from the housetops they proclaim the superiority of their goods over all competitors. Advertising comes to them by nature, and they regard printers' ink as a blessed dispensation of divine Providence. This indomitable energy of our business men is the natural result of that courage and endurance which reclaimed a continent from the wilderness, and peopled it with 50,000,000 of people. Plodding, methodical Englishmen may well study the business traits of our people, for the day is fast approaching when she will have to compete with them in every market of the world, and no Rip Van Winkle can do that successfully.

Sherman, of Chicago.

SINCE the CIRCULAR called attention to the fact that the agents of some of the Eastern manufacturers were making nuisances of themselves by hanging around the houses of New York dealers and trying to steal their customers away, these peripatetic drummers have taken themselves to the Astor House. Here they have rooms, and, like so many wily spiders, lie in wait for their victims. When they spy an out-of-town buyer they pounce down upon him, and lure him to their dens.

A few days since a manufacturer, well known for his practical jokes, was in conversation with a friend of his, a New Yorker, who boards at the Astor House, when one of these pertinacious Eastern drummers put in an appearance. He is rather "fresh" in the business, and our practical joker at once conceived a sell. He introduced him with much formality to his friend, "Mr. Sherman, a large buyer, from Chicago." The "fresh" young man was "delighted to see him," and forthwith whipped out his card and presented it impressively to "Mr. Sherman, of Chicago." With his accustomed pertinacity, the young man clung to his expectant customer, till he finally made him promise to call at the Astor House next morning at 8 o'clock and go over his samples. Next morning young "fresh" was at his post bright and early, watching for "Mr. Sherman, of Chicago," but that sagacious gentleman had breakfasted and slid out quietly an hour before the appointed time. Patiently young "fresh" waited—one, two, three hours passed and no "Mr. Sherman" came—the lunch hour came, but young "fresh" dare not leave his post, lest he should lose his customer, and so the afternoon wore away, with the hungry but persistent spider still on the watch for the fly that refused to come and satisfy his ravenous appetite. Finally, disgusted and starving, he packed away his samples and retired to his boarding house for his customary hash.

Next morning he was on hand again, however, and his vigilance was rewarded by catching "Mr. Sherman" just as he was about to leave the hotel. Having his victim safely hooked, there was no escape for him, and he was dragged up to the den above. The "fresh" young man spread out his samples before "Mr. Sherman," who knew less about jewelry than he did about the rediscovery of Vulcan, and expatiated upon their artistic beauty and excellent workmanship. While thus engaged, there came a knock at the door, and in pounced another of the Eastern drummers, who presented his card to "Mr. Sherman," and hastened out to get his samples to show. Soon another, who had heard about "Mr. Sherman," came in with his card and his samples, then another, and another, till all these peripatetic drummers were concentrated about "Mr. Sherman." He carried out his part of the joke to the letter, inspected everything, noted prices, received a few samples to show his partners, promised they should hear from him in a few days and finally made his escape. He sends his compliments to the "fresh" young man, and is much obliged for the string of pink pearls. He would like a box of them sent at once by cable.

A Hint to Uncle Sam

COMPLAINT has frequently been made of late that large quantities of jewelry are being smuggled from this country into Canada. A portion of it goes directly across the border by railroad, and a portion by way of St. John, New Brunswick. Of course, respectable and legitimate dealers, either side of the line, do not countenance this unlawful traffic; on the contrary, it is a great injury to them, for, being too honorable to participate in the robbery, they find their business seriously interfered with by those who do. Canadian dealers cannot pay duty on their goods and compete with those who do not pay duty; as a consequence, their orders fall off, and our manufacturers are deprived of their trade. A few years ago the trade in imported silks in this city was nearly destroyed by a gang of smugglers, who, aided and abetted by officers of the government, flooded the market with smuggled silks, which they sold for a far less sum than they could be brought here through the Custom House. Precisely the same condition of things is promised with regard to our jewelry trade with Canada unless the Customs officers exercise greater vigilance. Smuggling is a two-edged sword, which cuts both ways; it ruins the trade of the retailers at one end of the line, who cannot compete with goods which have not paid duty, and it affects the business of the manufacturer at the other end of the line, because the retailers cease to buy of them. It is true that the Canadian border offers many opportunities for smuggling, because of its great extent, but if two such powerful governments as the United States and Canada are unable to prevent smuggling to and fro over the line, they had better throw down the bars, and leave the pasture open to all comers. But there is a very general suspicion that whenever smuggling is carried on to any great extent, it is winked at by corrupt government officials. Exposures heretofore made have tended strongly to confirm this suspicion. We would respectfully call the attention of the powers that be in the Custom House to the state of things referred to, and suggest that the State political machine be permitted to run itself a short time, while the vigilance now consumed in wire-pulling is directed to the prevention of smuggling on the Canadian frontier.

WE have received from Mr. L. A. Favre-Brandt a small pamphlet, in the French language, giving a history of the watchmaking industry at Besancon. This colony was started in 1793 by a number of Swiss workmen, who had been driven from their native country because of their political opinions. They were followed by other refugees, and the watchmaking industry was established among them. At present the population of Besancon numbers between 15,000 and 16,000 persons. The work is distributed among the families, every member of which contributes something towards completing the delicate machinery of the numerous watches made there. Recently American watchmaking machinery has been introduced there by a local company, M. Favre-Brandt being largely interested. It is expected that very soon Swiss watches will be made by machinery with the same facility that American watches are made.

SIXTY-SEVEN failures occurred in this city in July, in which the aggregate liabilities amounted to $5,738,171, and the assets were estimated at $2,702,442. This shows an increase of thirteen failures and $1,400,000 of liabilities, compared with the record for the previous month, and an increase of 50 per cent. in number and double the amount of assets, as compared with July, 1877.

INFORMATION has reached the Post Office Department that certain persons in Massachusetts are defrauding the public by sending out illustrated catalogues of silverware, jewelry, and an invention by which butter can be made at a cost not exceeding four cents a pound. Orders containing money for the purchase of these articles have been detected by the post office officials, and returned to the persons forwarding the same, with an endorsement to the effect that the advertisement to which they have replied is fraudulent.

THE agreement between the United States and Great Britain for the reciprocal protection of trade marks is as follows: "The subjects or citizens of each of the contracting parties shall have, in the dominions and possessions of the other, the same rights as belong to native subjects or citizens, or as are now granted, or may hereafter be granted, to the subjects and citizens of the most favored nation in everything relating to property in trade marks and trade labels." It is understood that any person who desires to obtain the aforesaid protection must fulfil the formalities required by the laws of their respective countries.

WE find in a San Francisco paper a brief announcement of the death of Michael Reese, formerly of New York, but later of San Francisco. Mr. Rëese will be remembered by many of our oldest jewelry dealers, with whom he formerly transacted business. He started out in life as a pedler, tramping through Virginia with a pack on his back. German silver goods comprised a large portion of his stock. In 1849 he went to California and engaged in business, and soon accumulated a fortune. He is said to have been the largest real estate owner in San Francisco, next to Senator Sharon, and the approximated value of his estate is $10,000,000. Mr. Reese died at Wallenstein, Germany. In his early manhood he was noted for his stalwart frame and great physical strength and endurance.

MR. AMASA BRAINERD, of the firm of Brainerd, Steele & Co., died at his residence in Jersey City on the 26th of July, at the age of 63 years and 9 months. Mr. Brainerd has long been identified with the jewelry interests of this city, and was well known by thousands of dealers throughout the country. He was a member of the Veteran Corps of the Seventh Regiment, and of the Jersey City Yacht Club. He was universally beloved by all with whom he came in contact, both for his genial social qualities, and the uprightness of his character. The funeral was largely attended, there being representatives present from the various organizations of which he was a member, as well as many distinguished citizens. There were many floral contributions, and the remains were followed to the grave by a large concourse of sorrowing friends.

A STATEMENT was recently made in the N. Y. *Times* to the effect that the famous Matile watch that was exhibited at the Centennial, after being hawked about the country ever since, had finally been sold to a California miner who had more money than sense. This is a wholly gratuitous fling at one of the most artistic pieces of workmanship identified with the watchmaking industry, which has become noted for its marvelous productions. The Matile watch was the most complete piece of mechanism ever produced in that form, and was regarded by watchmakers and scientific men as the acme of perfection. Of course, such a watch was of great value, and, much as it has been admired and coveted, Messrs. L. & A. Mathey, the agents, positively refused to loan it for exhibition purposes, and as to its being "hawked about," that is absurd. Once or twice only, a dealer asked to submit it to a probable customer. There never was any necessity for "hawking it about," for the reason that every watchmaker in the country knew all about it, and just where it was to be found. It has been for sale ever since the exhibition closed, the same as most other goods and wares exhibited there have been. The attempt of the *Times* to belittle or disparage a piece of work which is unequalled in the world for excellence and artistic beauty, is not at all complimentary to its judgment in such matters.

THE trade throughout the country is cautioned against the operations of what appears to be a regularly organized gang of swindlers. These men travel about the country representing themselves to be the agents of Eastern dealers, and their business that of soliciting orders. They will call upon a dealer, produce a letter apparently written by the firm they claim to represent, congratulating them on the success they have met with, notifying them that all their orders have been filled, and telling them to "draw on us if you are short of money." Sometimes a draft accompanies this letter. Very naturally the dealer is misled by these statements, and cashes the draft. The whole business is a swindle, the letters forgeries, and the drafts not worth the paper they are written on We warn the trade to be on the lookout for these swindlers, and not to part with their money till they know who gets it.

A New Compensation Balance.

IF there is any one thing more than another which has baffled the skill of the most able horologists for years, it is the production of a perfect compensation balance, which at least might give us a correction for the errors produced by the changes of temperature to the extent of 60° or 70°. Numerous devices have been called into requisition, large sums of money have been expended in experiments, and science has been called to our assistance, but all in vain. It gives us therefore great pleasure to be able to inform the readers of the CIRCULAR that our worthy colleague, Mr. H. H. Heinrich, has invented a device for an auxiliary compensation for the correction of the errors in extremes of temperature, for which he claims, that by its action a perfect adjustment is obtained for a temperature of from 20° to 120° Fahrenheit. One year's trial is the basis of this assertion—and indeed, a careful inspection by myself of this new device lays bare no appreciable defect which would tend to throw the least doubt upon the possibility of obtaining results such as are claimed by Mr. H. H. H. As this gentleman is about procuring letters patent in different countries, I am not at liberty to lay a full description of this invention before the readers of the CIRCULAR at this time, and I must content myself to allude to those points only in which it is superior to the balances.

1.—The auxiliary pieces can be attached to any ordinary compensation balance, and can be brought into action *after* the ordinary compensation is adjusted.

2.—These pieces are extremely simple and easily made, and can be made effectual for extremes of both heat and cold—so much so that a chronometer can be made to go fast in both extremes, if this were desirable. The auxiliary adjustments for heat or cold are independent of each other.

3.—The scope of an accurate adjustment lies between two very extreme points of temperature, *i. e.*, from 20° to 120° Fahrenheit.

It is sincerely to be desired that this balance may prove a success, for Mr. Heinrich is one of those horologists who have devoted their whole lives to their profession. He is deeply skilled in all the branches of his art, a gentleman, modest and conscientious. Messrs. Tiffany & Co. may be congratulated on having so able a man in their employ; and indeed, this distinguished house may be said to have sufficient horological talent at its command in its establishment to produce almost anything in the shape of a fine complicated watch, should they be so disposed, Mr. Albert Potter's assertion to the contrary notwithstanding. If Switzerland has her Ekegren, Kauvup, Borgstedt and others (the last named gentleman is the adjuster of the Matile watch), we have our Heinrich, our John C. Simmonds (a worthy *elève* of that King of Watchmakers, Mr. A. P. Walsh, of London), and an abundance of native and foreign talent, which would astonish Mr. Potter. Should any firm or company ever undertake to produce watches, which require a high degree of manual skill and a comprehensive intellect, I vouch for it, the products of this country would be second to none! H. REINECKE.

Legal Regulations for the Standard of Gold and Silver Ware in the Different Countries of the World.

BY EDWIN W. STREETER.

STANDARD is the term used to express the relation between the pure gold and silver in precious metal goods and coins, and the alloy with which it is mixed. The degrees of standard were formerly expressed, in the case of gold, by carats (the dried kernel of the locust-bean), of which, in Germany, twenty-four were called a mark. The carat was further divided into twelve grains. Twenty-four carat gold was of absolute purity.

In England this manner of determining the standard quality of gold is still in use.

The standard of alloyed silver was formerly indicated everywhere by its weight; and it still is so indicated in many countries.

Sixteen ounce silver is *pure* silver.

An ounce divides itself into eighteen "*grains*."

Following the example of France, it is now usual to indicate the standard of silver and gold by $\frac{1}{1000}$ parts.

As a rule, there are three methods of deciding the standard, the oldest being *the stripe stone*.

In the goldsmiths' regulations at Ulm, in the year 1394, we find the following: "In testing gold, *a stripe stone* shall be made use of, *according to old custom*."

This is, in fact, an old custom; for the ancient Greeks made use of such a stone, which was called *Bavavop*, from the purpose for which it was employed; and sometimes the *Lydian stone*, so termed because it was found in the river Imolus in Lydia.

This testing stone is black, and consists of black jasper or stone of Lydia; and the quality of the silver is judged of according to the color of the stripe which it leaves upon the testing-stone when drawn across it.

To insure a correct decision, the stripe of the article which is being tested is compared with the stripe made in the same manner by the *testing needles*, as they are called, which are of known standards, and of which each tester possesses a great number. In the stripe test as applied to gold, the standard is determined by the manner in which the nitric acid, freed from the oxymuriatic acid, acts upon the stripe of the alloy being tested.

The *stripe test*, however, serves only for a superficial decision of the standard. It is especially deceptive when the silver contains large quantities of zinc or nickel, because these metals when used as alloy alter the color but little.

In later times, gold has often been alloyed with zinc; especially in America has this been done. This alloy has a very beautiful color but proportionately the standard is reduced to the lowest degree. Thus it happens that in melting old silver articles an alloy of zinc is often found, this metal having been included in the standard of such articles.

A more exact method is the *test by fire*.

Here a small quantity of the silver to be tested (a definite weight) is refined in a small crucible made of beech-wood ash and bone-dust, or else of bone-dust alone, saturated with vegetable salts. The silver is mixed with lead and melted under a cover. By this means the inferior metal is oxydized and absorbed in a molten condition by the porous substance of the cup, while the pure silver remains behind in the form of a small flattened bead or corn. The weight of this bead, compared with the weight of alloyed metal which was originally employed in the process, shows the standard of the silver.

It is important that the refining process should be carried on with the least possible amount of heat, to prevent the too rapid evaporization of the lead.

In the latter part of the reign of Charles X. of France, Gay-Lussac introduced a new method of testing silver, as he himself modestly admits in the preface to his work entitled, "Complete instructions as to the proceeding of testing silver in the *wet way*" (a work which was translated by Liebig, and published in the year 1833.)

Tillet had already made known, in the memoirs of the Royal Academy of Science, between the years 1761 and 1769, that the process of refining silver from its alloy yielded by some thousandths too little.

Tillets experiments, however, were soon forgotten, or rather it was somewhat hazardous to attack a process upon which all commerce in silver was grounded, and which was in common use almost everywhere. Moreover, the necessity of a change for the better was the less felt, inasmuch as no complaints were raised about it, and because the loss occasioned by the under-estimation of the value of the silver goods passed unnoticed from the seller to the buyer.

Thus it was the practice was transmitted from one age to another, and was closely adhered to by those who were successively employed in carrying it out in the Mint, and in the Stamp and Control Offices. In the meantime, while the advances made in the art of refining proved the possibility of extracting profit even to the $\frac{1}{1000}$ part of gold from silver, a large quantity of pure silver accumulated daily in the Mints.

Now, since pure silver deteriorated in the crucible only to the extent of $\frac{1}{1000}$ or $\frac{2}{1000}$, and alloyed silver of $\frac{900}{1000}$ lost $\frac{4}{1000}$ or $\frac{5}{1000}$ in value, it followed as a necessary consequence, that a director of the Mint receiving pure silver to be coined into pieces of money of $\frac{900}{1000}$ standard was compelled to make the actual standard of such pieces of money $\frac{903}{1000}$ or $\frac{904}{1000}$, that they might answer to $\frac{900}{1000}$ when tested in the laboratory of the Commissioners of the Mint. The director began, therefore, to sustain in such coinage a loss of from $\frac{3}{1000}$ to $\frac{4}{1000}$; and the cause of this could not long remain concealed from him. In this way arose the complaints which led to a fresh investigation of the testing process as carried on with the crucible.

The new test, called the *Tirtir Method*, or *Wet Test*, demands a previous approximate decision of the standard by means of the *strepe* or *fire tests* and admits itself of the greatest precision. It is carried out in this manner:

Either a definite weight of alloyed silver is dissolved in nitric acid, and the silver in solution precipitated as chloride of silver by means of a solution of common salt, in which case the standard of the alloy is reckoned by the solution of common salt required for this purpose; or else from gold is produced oxide of gold, free from oxide of iron; the oxide of gold made soluble in oximuriatic acid, and amalgamated with oxalic-acid; and the amount of oxalic-acid, which does not become oxidized, determined.

WHILE in the City of Mexico Gen. Jefferson C. Davis became the fortunate purchaser of a diamond scarf or shawl pin, which, in addition to its intrinsic beauty and value, is of great historical interest. The pin was presented by the Emperor of Austria to the ill-fated Maximilian before the latter left Vienna for Mexico, and worn by Maximilian until after his sentence of death, when it was presented by him to a faithful Mexican adherent. During the perilous times following the execution of Maximilian, the owner of the pin found it necessary to realize on his valuable present, and it was offered for sale in one of the jewelry establishments of the City of Mexico. The pin is of gold, oval-shaped, the upper portion surmounted with a crown, the whole resting on the wings of the Mexican eagle, while the eagle holds in his claws, or rather is standing on a large diamond. The central portion of the face of the pin is a dark blue ground of enamel, on which, in silver, studded with small diamonds, are the combined coats of arms of Austria and Mexico. Beneath the coats of arms, and also on the blue ground, is the monogram "M. I. M.," Maximilian I., Mexico. The blue enamel is surrounded by two rows of small diamonds, running entirely around the face of the pin; these are set in silver. The letters of the monogram are in silver, in which are set very small diamonds. There are 85 diamonds in all on the face of the pin; some of these, as for instance those set in the letters of the monogram and in the crown surmounting the pin, are very small. The velvet case containing the pin is stamped with the Austrian and Mexican coats of arms, and also Maximilian's motto: "*Equitad et la justitia.*"

The Goldsmiths' Work at Mycenæ.

THE bodies as they lay on the funeral pyres had been piled with golden ornaments and vessels of gold and silver. The women in the third tomb were buried in a heap of ornaments and jewels, among which were no less than seven hundred disks of gold *repoussé* work in a variety of patterns, large flat rounded leaves with stems and veins, flat pieces of gold engraved in intaglio, necklaces, pendants, and flat ornaments in the shape of women and animals, and many large flowers of several gold leaves fastened in the middle, all these ornaments looking as if they were intended to be sewn upon women's robes. One head wore for a crown a thin broad band of gold with a border of standing flowers on its upper edge, and by the other bodies were several diadems, likewise thin bands of gold, richly ornamented in relief. It is reasonable enough to suppose from their great differences and individuality that the golden masks which covered the faces of several of the men were meant for portrait masks, excepting one which represented a lion's face. To provide them for a burial was a natural means of hiding from the spectators the painful destruction of the features by the funeral fires. The heaps of bronze swords, stone arrow-heads, and battle-axes of both stone and bronze, showed that the warriors, like those of all primitive peoples, were buried with their arms. The rows of gold buttons, lying beside the swords as if fallen from the scabbards, their golden hilts, shoulder-belts and breastplates show the splendor of their panoplies, and their graves were strewn with cups of gold and silver. The collection of copper kettles and cans in the largest tomb shows that these, too, were a highly prized part of their wealth.

The workmanship of the metal objects suggests some interesting speculations. Except for the bronze swords and axes, which must have been cast, there is hardly an indication of any work but that of the hammer and graver. With all their profusion of gold it is clear that the men of that early day understood, almost as well as we of the nineteenth century, how to make a little material go a great way. A few rings and seal-like pieces of intaglio, and one or two ornaments which Dr. Schliemann distinguishes as "massive," are apparently the only things of that metal in his enormous collection that are not wrought out of thin plates. There are indications that most of the abundant *repoussé* work was extremely thin, although he says little about this. The one piece of gold that was spared for analysis is said to have been only one one-hundredth of an inch thick, which is about the thickness, under firm compression, of two leaves of the paper on which this is printed. Even the cups and larger objects which Dr. Schliemann calls heavy, are apt to show, in his illustrations, a finely crumpled surface which indicates thin metal. The gold was remarkably pure, and therefore remarkably pliant; for the piece that was analyzed was alloyed only with ten per cent. of silver. The softness of the gold of one of the masks is especially mentioned.

Dr. Schliemann quotes from Prof. Landerer a supposition that the *repoussé* work was hammered out upon a block of lead, as is done nowadays, and the finest of the work may very well have been done in this way. But the character of much of it, and especially its constant reduplication, suggests a different process, of which an explanation is furnished by the book itself, though apparently unnoticed by its author. He found in one sepulchre seven hundred thin gold disks, of two or three inches in diameter, and he gives illustrations which, he says, include all the different forms of them. He found also in one tomb fifty-three cuttle-fish, apparently of thin gold, and "perfectly alike." All these, and many things of like character that are given, have the rough-edged look of ornaments that are cheaply swaged out or stamped with a die. Many of them are found in pairs, some actually soldered together, and others provided with rivet holes in the edges. In one case a silver pin was found, with a broad flat head of gold, composed of two hollow shells soldered together back to back, clasping the pin between them. There were many similar objects with the halves separated, but clearly intended for a like use. It is noticeable too that the ornaments of this kind are symmetrical about one axis, so that the two halves could be made on a single pattern and put together, unaffected by reversing. These things could hardly have been made and duplicated by hand work, merely hammering into lead. Much as we like to believe in the unsophisticated simplicity of the heroic ages, and shrink from the idea of their employing the tricks of cheap manufacture, it is in evidence here that they had a plentiful supply of cheap jewelry, made thin and hollow, and endlessly repeated from stock patterns, as children's tin horses are made, or as such jewelry is made nowadays, but with this difference, nevertheless, that it was really made of gold, and was worn apparently by persons of royal blood. There is a good deal of Etruscan and Egyptian jewelry to be found in various museums which is made in halves in this way, sometimes hollow and sometimes filled with baser metal; but it is generally in pieces of small size and delicate workmanship, such as pendants to earrings and necklaces. It is only in Mycenæ, as yet, that proofs have been found of its manufacture on a large scale and by rough processes, as if to suit the tastes of a semi-barbarous people.

Now Dr. Schliemann gives us cuts of two blocks of stone, one of granite and one of basalt, on the faces of which are sunk intaglios of ornaments resembling in character the cheap jewelry of which we have spoken. He considers them to be moulds in which gold ornaments were cast. But two or three difficulties present themselves. There were practically no cast ornaments found at Mycenæ. Among the thousands of ornaments enumerated in the book, but one is believed to have been cast. Then too the indentations in the surfaces of the blocks are apparently very shallow, so shallow that it would have been very difficult, not to say impossible, to cast in them with any success, especially since there are no vent-holes, and the blocks seem too roughly finished to have received a cover. In this respect they differ from the moulds of clay stone which Dr. Schliemann found at Hissarlik, and from others found by Mr. Layard at Nineveh, in which the sinkages are deep and extend to the edges of the blocks, or are provided with vent-holes, where too the surfaces are smoothly dressed so as to fit a reverse or cover, showing in some places the holes for the pins or dowels by which they were adjusted to each other. We may confess, too, that we have never been able to see how moulds of ordinary stone, although they might do for metals that fuse easily, could be used for casting gold. It is to be remembered that gold is rather less fusible than cast iron, not melting till it is nearly at a white heat. A mould of sand or clay will stand such a temperature; but one of any granite with which we are acquainted would be destroyed by it. Nevertheless Mr. Layard assures us that such moulds as he found at Kouyunjik and Nimroud are in use among the Arab goldsmiths at this day, although he does not tell us how they are used. But a hard compact stone like the granite (which we suppose to mean syenite), or basalt, is a very appropriate material for a mould in which a sharp, minutely finished intaglio is to be cut in order that a plate of pliant metal may be hammered into shape upon it with punches. This seems to us likely to be the office of these moulds, and the explanation of the character and multiplication of the ornaments found in such profusion.

Many of the ornaments are of better execution than those we have mentioned; the large gold flowers, for instance, made of leaves cut from sheets as if with the shears, leaves which do not exactly repeat each other. The diadems are, judging from Dr. Schliemann's illustrations, more finely wrought than the rest of the ornaments. They are oval bands of gold from eighteen inches to two feet long, from four to six inches wide in the middle and tapering at both ends. They are wrought with great delicacy and precision, and look as if they had been hammered up by hand very skilfully and finished with the graver. In design and execution they are superior to the comparatively rude adornments which filled the tombs in such profusion. These diadems, like all the rest of the work, seem to be of very thin metal, pliant enough to adapt themselves to the head, and some so thin that they are strengthened by piping their edges with copper wire, another device which is commonly credited to modern times alone.

Practical Hints on Watch Repairing.

By Excelsior.—No. 41.

EXAMINING THE DETACHED LEVER OR "ANKER" WATCH.

(636) Although a little out of place, after supposing the escapement to have been examined. (314 to 437, 452 to 457), we will now commence at the beginning and give directions for making the examinations previous to that, as well as those coming after it, in order to have the whole together, and so indicate a systematic method of examining watches. The young workman will doubtless be somewhat amazed at the multitude of points to be tested and looked after. Yet, out of this great number of details, scarcely any can safely be overlooked or omitted in the examination. Some will need only a glance, others require a special trial. Of course, no one watch will have all of the faults described, but, as any one of them may be found in the very movement in hand, the only safe rule is to suppose nothing correct till we find it so. How absurd, then, are the pretensions of so many workmen, who will take in a watch, give it one or two wise squints, and at once name the price for putting it in order. The fact is, they give one thought to the question: "What is the matter?" and two to "How much will he stand?"—the point with them being to bleed the customer all they can, regardless of the value of the work, or of common honesty in their dealings.

(637) Taking our watch from the rack, we examine the case for bruises or injuries, the action of the lifting and holding springs, etc. The condition of the hands first claims our attention. In addition to the directions given in sections (193 to 199), and (288 to 292), the following may be said: See that the point of the minute hand does not run nearer the dial on one side than elsewhere, (of course, supposing the dial to be just evenly down upon the plate.) If so, the center pinion is out of upright. Find the figure on the dial which the hand comes nearest to touching, and note it on the bench slip, (618). If it is much out, the error should be remedied, unless there is plenty of room between the dial and the glass, and the minute hand can be adjusted so as not to touch either of them, while at the same time the hour hand will not interfere with either the seconds or minute hand. If all this cannot be made *certain*, the center pinion must be uprighted. When the error is caused by the holes or pinion being worn, it should of course be corrected, even if it did not make the hands interfere.

(638) Examine the seconds hand in the same way. If it runs high on one side and low on the other, note the lowest side as before. Then, when examining the train, see if the fourth pinion can be uprighted without too much disarrangement of the depthings of the third wheel in the fourth pinion, and of the fourth wheel in the escape pinion. If these depthings, etc., are all correct as it stands, and uprighting it would necessitate enlarging one wheel and making the other smaller, etc., it would of course be better in a cheap watch to let it stand, and try to adjust the seconds hand so as not to interfere with the others or with the dial. But in a good watch, and a thorough job, the pinion should invariably be upright. In a dial with sunk seconds cemented in, one side or the whole could be slightly lowered, if necessary, to give the seconds hand more room at its lowest place, (637). In adjusting the sunk seconds dial in position, first find how it should stand, to be parallel with the plane in which the seconds hand turns. To cement it in parallel with the main dial, cut a piece of blotting paper a little smaller than the seconds dial, and the thickness that it is to be below the surface. Having softened the cement by heat, lay the dial on the bench, face down, with the blotting paper under the small circle, and press the whole gently till cool, when the seconds dial will be found both level and properly sunk, without any bother. If the main dial is rounding up at the center, instead of nearly flat, the small dial should be sunk more below the surface at its figure 60 than at the 30. In such a case, have an extra thickness of paper at the side which is to be most below the main dial, and proceed as before.

(639) We now see if the barrel or main wheel touches the band or middle of the case. If so, we must trim the band to clear it, if possible. In a thin gold case, this might not answer, and the barrel should be lowered. Make a note of this fault, to take into consideration when examining the barrel, etc. See if the balance rim, or the screws in it, can touch the case band, or the lift spring when the front cover is shut. If so, trim out the band, or file the spring. If the latter cannot be done, nor a new one fitted which will clear the screws, we may perhaps substitute screws which are shorter and thicker, or raise or lower the balance by altering the end stones, etc. In a cheap watch we may bend the balance arms, or, with a common uncut screw balance, we can turn off the ends of the screws slightly. The touching of the screws on the side or top of the lever bridge has already been mentioned. Also, when the balance rim projects beyond the edge of the plate, be very careful about taking the movement out of the case and putting it back, or you may bend or break off a pivot. Movements are sometimes found which cannot be safely removed or replaced in the case without taking out the balance. Such instances are not common, but the workman must be on the lookout for all such points. Also, when the end of the lever fork projects out. This is quite frequently the case, and caution should be used.

(640) If the balance cock looks pretty high, as if the regulator, or its nut, or screws, are likely to touch the dome (or inner case) when shut, it should be tested, as it might cause stoppage by pressing the cap jewel down upon the pivot. Cut a square of thin blotting paper a little larger than the regulator nut, and place it thereon, holding the movement horizontally till the dome is shut. Then turn it edge up and tap gently on the hand, again hold horizontally, and open the dome. If the paper fell off the nut when tapped, it shows plenty of freedom. But if found on it when opened the freedom should be further tested with a square of thin writing paper in the same way. If that remains on, it is evidently too close, and we can never feel safe, especially if the end-shake of the balance is small. Make a note of this, to alter when the watch is apart, either by taking off the points of the screws, or lowering the balance cock, or, in cases of necessity, by thinning the regulator nut or ring. When the fault cannot be so remedied, we can turn out the inside of the dome in the lathe, at that place, if it is of silver or gilt. To mark the spot, we put a little rouge and oil on the regulator nut, or the screw ends,—the highest points,—and shut the dome, when the rouge will stick to it and mark the place of contact. In a gold case, with a thin gold dome, it might not be practicable to turn out any cavity, and it must either be raised up in some way, or we must shorten the balance staff by taking off the pivot shoulders, and adjusting the cock down to it.

(641) Sometimes the point of the hair-spring stud, or the collet or hub in which it fits, touch the dome, and are pressed down in the same way, causing occasional stoppage of the watch when the case is shut, or the stud, if not very tight, will be pushed out. This can be detected by the rouge and oil test. The dome may also shut down on the dirt cup around the center staff, or on the screws which hold it, and force the center wheel bridge down on the shoulders of the pinion. When the cup is carried by the center staff, it should not touch the dome at all, however lightly, whether it is entirely inside or comes out into the hole in the dome. Test this by turning the staff around and find if the cup clears in all positions. Also look on the cup and in the hole for either a bright fresh mark or a black one. The former shows recent rubbing, the latter an old fault. Neither the end of the center staff nor the winding arbor should project above the surface of the dome, or they must be shortened and the ends repolished. If the case and dome are thin, and the outer case shows a mark from the center staff, that should be made still shorter, to prevent touching when in use, and

the owner should be cautioned about squeezing it too tightly when carrying it.

(642) See if the case band can touch the lever bridge or its screw, and press the jewel down upon the pivot shoulder. If it comes very close, it should be freed, as shutting will often cause it to touch, although it does not while open. If the hinge of the dome comes opposite the bridge, still greater care must be taken in testing the possibility of touching, when open, or especially when shut. Very often, after the lever bridge has been carefully adjusted to hold the fork horizontally, when the movement is put in the case the band will press on one end of the bridge and move it out of place, throwing one end of the fork up, and away from or towards the roller table. This is very annoying and difficult to detect when the fitting of the escapement is close and particular. The proper course is twofold: both to adjust the steady pins so that they will hold the bridge where it ought to be, without relying upon the screw, (628), and to alter either the bridge or the band to prevent touching. If the hinge of the dome is near it, apply the rouge and oil test before finally finishing the adjustment. Some mark the plate along the foot of the bridge to show if it is altered, but there is no need of that if the steady pins are properly fitted and the bridge firmly screwed down. All of the directions in this section apply equally to the escape wheel bridge, screw, etc.

(643) See that the movement holding screw has a good bearing on the case band, and holds the movement fast and firm. If the screw head does not set over the band far enough for safety, fit in another with a larger head, turning out its sink in the plate if necessary. It should also set well around, and not hold by merely one corner. If so, either dress off the band to permit the screw to turn further around and hold by a whole side, or, if it is already screwed up to the head in the plate, turn out the sink a little to permit it to go further in. Do so, also, if it does not hold the movement tight when fully turned in. If the head comes against some part of the lift or holding spring, which prevents it setting well over the band, take out the spring and file a notch in it to free the screw head. If the edge of the band is worn or torn off where the screw bears on it, it can be swedged out from the inside of the case. Rest the narrow edge, on which the edge of the movement lies, upon a stake or anvil with a rounding edge, and use a rather small punch, with the sloping side of the point outward or toward the band, and the vertical side towards the center of the case. The punch should not be too sharp, *i. e.*, the slope angle should be rather obtuse. Finish with a flat-end punch, then level and polish the outer surface. In some cases it will be better to fit in a loose piece, held down by the screw, with one end setting over the case band as required. No matter how much trouble it may be, the movement should be made tight and safe in the case.

(644) We next take the movement out of the case, and examine the dial. If of metal, with a band clasping the edge of the plate, this band should hold the dial securely on the plate, even when out of the case. If loose, tighten the band. If this cannot be done, drill through the band into the edge of the plate, and fit two or three fine pins, letting the ends project slightly for convenience in removing them. If it is an enamel dial, first see that its edge is even with that of the plate, then that the pins or screws to its posts hold it securely in place. Remove the hands and see that the dial holes are properly placed with reference to the parts that go through them so that there is no liability of the sockets of the hour wheel, or the hour or seconds hands touching. Always remove the hour hand when putting a watch in order, as there are several important points which cannot otherwise be known to be correct. Many workmen practice leaving the hour hand and wheel in the hole and on the dial. But this should not be done, unless we have recently put them in order ourselves, and are sure that nothing has since happened to them. If the holes in the plate are too large for the dial posts find on which side of the holes the posts should be, and (when the movement is apart) close the holes from the opposite sides to keep the posts in place. Do this on the back side of the plate, under the dial.

(645) If the dial does not fit flat down to the plate all around, it must touch on some screw points or heads, minute wheel stud or pinion, barrel arbor, or stop works; or, sometimes, the cap jewel is too thick, or its setting or screws too high. Find the trouble and remove, by shortening the screws or stud; if it is the jewel, raise its setting, or put in a thinner jewel, or stone off the projecting part. But if that is difficult, or if the barrel arbor or stop works touch, the easiest way is to dress the enamel off at those places with an emery or diamond lap or file, but no more must be taken off than to come to the copper, or we shall crack the face of the dial. If that is not enough, or the stop wheel screw sticks up higher than necessary, it can be thinned down. The end of the barrel arbor can also be shortened some without reaching the pin hole through it. With a metal dial, these faults can generally be remedied by gently springing the dial.

(646) If the hour wheel is tight when the dial is thus lowered, (645), it must be freed. If the leaves of the cannon pinion reach considerably above the minute wheel teeth, a cavity or sink can be turned in the under side of the hour wheel to let it down, but it should not be so low as to rub on the top of the minute wheel. If the hour wheel is already low enough and is quite thick, it can be turned thinner from the top. If already thin enough, it can be lowered by dressing off the upper ends of he cannon pinion leaves. This should have been done at first, if the leaves stuck up very much above the minute wheel. Sometimes the pinion ought to be lowered bodily. This can be done by turning out a cavity in its bottom to let it set further down on the staff, or even over the projecting end of the center pinion. If this would make the leaves touch the plate, turn them off enough to give a safe freedom from the plate. If the hour wheel then has too much play between the leaves and the dial, put on a foil washer. But if the hole in the hour wheel is too large for the cannon pinion, a new wheel should be fitted, as this wobbling and tipping is sure to cause trouble. The washer will not cure that.

(647) Before actually making the alterations named in the preceding section, we examine the rest of the "motion wheels." The stud which carries the minute wheel and pinion, or that intermediate between the cannon pinion and the hour wheel, should be perfectly tight in the plate and upright. It should fit nicely in the hole in the pinion, so that the wheel can turn freely on it without being too loose. If the minute wheel interferes with the barrel, the stud should be taken out and moved off far enough for them to clear, taking care to keep the depthings of the motion wheels the same as before, *i. e.*, the center of the stud should be the same distance from the cannon pinion center as before.

(648) If the hour wheel rubs on the barrel, and it is quite thick, thin it from the under side. But if already thin enough, or thinning it would endanger its working in the minute wheel pinion, the barrel should be raised. If that cannot be done, then the motion wheels must be taken out and replaced with a set of smaller wheels and pinions, by which means the new hour wheel will be made to clear the barrel. When the hour wheel interferes with the stop works on the barrel, they should not be taken off, as is often done, as that is a shiftless way of shirking the job. They are put on for a very useful and essential purpose, and the workman has no right to abstract them to favor his own laziness or incompetence. The female stop can generally be thinned or bevelled off enough to clear, without injuring its operation. If not, the motion wheels should be made smaller, as just described. The final examination of the depthings of the motion wheels must be left till after the alterations of the center pinion or its pivot holes, if such alterations are required. Further remarks will be reserved for the article on the depthing of wheels and pinions, only adding here that the teeth should of course all be straight and well shaped, and the wheels work in the pinions

with perfect freedom, neither gearing in so shallow that the points will butt, nor so deeply as to clog or get bound; the hour wheel should not be liable to work over the top of the minute wheel pinion, nor the minute wheel over or under the cannon pinion leaves.

(649) *Examining the escapement* is next in order. Directions for the detached lever escapement were given in sections (314 to 437), and nothing more need be added, except a caution to the beginner to always let the mainspring entirely down before taking the train or escapement to pieces, or a broken wheel or pivot may be the result. A number of errors crept into those sections, but it would be impracticable to correct them here, without considerable repetition and explanation, and additional cuts. Even then it might not be entirely clear, so separated from the context. Besides, it is hoped that the careful reader understood what was meant, although it was not correctly printed. At this stage of the examination, several subjects come up which must be deferred for the present, such as polishing the brass parts; removing rust or spots from the gilt or steel parts; polishing and coloring screws; removing fragments of broken screws, etc. If the plate or any of the bridges, etc., look whitish, from the gilding being scoured too hard, or if any of the wheels have had teeth inserted, or any repairs have been made which took off the gilding, and left spots of black or tarnished brass, the customer should be advised to have the defective parts regilded. Directions for doing this will follow hereafter.

(650) *Examining the Anker train.* In a watch that is comparatively clean, with the mainspring let entirely down, all the wheels of the train, as well as the lever and balance, should fall freely by their own weight, when raised to the upper limit of their shakes. They should do this with either pivot upwards, *i. e.*, holding the movement in either of the horizontal positions, dial up or dial down. Of course they would not do this in a dirty watch, with gummy oil, etc. Nor would they in one comparatively clean, if the pivot was imperfectly shaped, with a "lump" at the shoulder, instead of being turned with a perfectly square corner. The effect of this is that, the pivot being a little larger at the shoulder, owing to this rounding part, when the pinion is forced to its highest end shake, the pivot is very likely to be tight in the hole, although it may be free when the shoulder is a little away from the jewel. Such a watch will be liable to stop whenever held in the position in which the shoulder falls towards the jewel. This fault can generally be detected by the test in section (633), as well as by the wheel refusing to fall when lifted, as above described. The best remedy is to grind off the lump with a perfectly square-edged grinder, either a lap or slip, and then polish shoulder and pivot. With the dead-center lathe, or turns, it is better to turn a perfectly square shoulder to the pivot with a sharp graver, than burnish it with the pivot burnisher, and polish the shoulder with a boxwood slip and crocus or rouge.

(651) In a dirty watch, when taking hold of a pinion with the tweezers, it should be moved freely through the extent of its end-shake, with no catching nor rubbing; nor must the pinion move hard, and then, after the application of considerably more force, jump through the rest of its play. Nor should it be hard to make the pinion move at all, as that shows either a pivot rusted or cut into grooves, or else no end shake. There should be sufficient end shake for perfect freedom, but no more; in the escape wheel pinion, it should be equal to the diameter of its pivot; the end shake of the fourth, third and center wheel pinions should ordinarily be equal to the diameter of the upper fourth pivot. But there may be special reasons for having it different, in some cases. The end shake should be slightly more with very long pinion arbors than with common or short ones, else stoppage may result. As brass contracts in cold more than steel, the contraction of the pillars or bridges, in such a watch, may be enough greater than that of the pinions, to bring the jewels tight against the pivot shoulders, when exposed to a very low temperature. The same is true of a very long balance staff, or other similar part. But the end shake should not, as a rule, exceed half the length of the pivot, no matter how short that may be. In the case of a very short pivot, if the proper end shake would exceed half its length, the pivot must be lengthened, by turning back the shoulder, either with the graver or the "shoulder-scraper," (297). The above also applies to pivots with end stones.

(652) To increase the end shake, when insufficient, the proper course is to turn back the pivot shoulder as just stated. In cheap watches it is very often done by raising the bridge. Lay it on the anvil or stake, on one side, and hammer along the side of the bridge to raise a sort of ridge on the bottom. Then do the same with the other side. If well done, these ridges will be even and substantial, giving a firm bearing to the bridge when screwed down, and will raise it bodily, while at the same time keeping it horizontal with the plate. If too high, file the ridges off evenly, which will lower it again. If not horizontal, file off the projecting parts of the ridges, or hammer up the lacking places. This method is not recommended for any but cheap watches. Even in them, it should be done without leaving any marks on the outer surface. Scratches, bruises, or mars of any kind condemn a workman in the eyes of the most inexperienced customers, while a neatly executed job raises him in the estimation of his fellows, and adds to his own self-respect and satisfaction. To lessen an excessive end-shake, file the whole of the under side of the bridge evenly, and close around the steady pins, but without injuring their shape.

Sham Cape Diamonds.

THE large and rapid output of diamonds from the diggings in South Africa has tended to depreciate the market price of these gems, and their value is likely to be still more seriously impaired by a report which has been spread abroad that many of the so-called Cape diamonds, though in appearance perfectly genuine and of good water, are artificial and really worthless. The brilliancy of many of these sham gems is so great as to deceive at first sight even experts; and it is therefore not surprising that the general public should look with suspicion on any brilliants that may be offered for sale. In the case of the spurious diamonds manufactured of "paste," there is, however, a simple test which is easily applied by anybody, and which is perfectly infallible, viz.: to draw a fine file sharply across the suspected gem. On the soft paste, the file will leave a well-defined mark; but it is powerless to injure a real diamond, the owner of which need not fear the application of this rough-and-ready test. Besides the manufacture of the thoroughgoing "paste" diamonds, however, which are turned out to a great extent, there is practised a species of fraud known as the "doublet" fraud, which it is much less easy to detect. This is described by a well-known jeweler as "the combination of a well-cut crystal with the facing of a genuine diamond, the latter so thin in itself as to be comparatively worthless, but when cemented with a colorless cement on to the face of the crystal is likely to deceive the best judges, and enhance the value 1,000 per cent." Here the file ceases to be a test unless the "stone" is taken from its setting. Then an application of the steel instrument to the edges resolves any doubt. This removal of a stone from its setting, however, is a matter of difficulty, perhaps of impossibility, under certain conditions, but as the best diamonds are set with the "open setting," *i. e.*, with the back exposed to view from underneath the ornaments, it ought not to be difficult to be on one's guard against an apparently good diamond not so set. The following method of examining suspected stones is suggested in the *Times*, and may be of use in these and other cases: "If the specimen is immersed in water, should it be a diamond it will sparkle with undiminished light and brilliancy of color; but if it be spurious, the "fire" of the jewel will be completely quenched." Professor Soustadt has invented a liquid by means of which the specific gravity of diamonds and other precious gems may be easily tested by placing them therein. For use in the Colonies, however, where the gems are bought and sold unset, and often uncut, the use of the file is perhaps as simple and efficacious a test as could be suggested.—*Colonies and India.*

Precious Stones and Gems.

BY EDWIN W. STREETER.

THE mines still open are between six and seven hours' journey W. S. W. of Ellore. They were visited by Heyne in 1795, and are known as the "Mallivully," so called from one of the seven villages of that name, where the miners live. In the neighborhood of these villages, on the north bank of the Kistna, is the Gani Mine, which has in our times received the name of "Partala."

Golconda itself has no mines. The fort was the storehouse of all the great diamonds in the Nabob's dominions.

The plain on which the villages lie round about Mallivully is on all sides surrounded by granite rocks. The average depth of the alluvium in which the diamonds are here found is twenty feet. This alluvial deposit extends along the banks of the Kistna for the distance of about two or three hours' walk.

The change from a grey to a red soil, consisting of weathered granite gravel is here distinctly seen. The upper layer consists of the black "Cottonsoil," brought down from the higher grounds by floods. This quickly changes before the blow-pipe into light, porous lava, or even to a glass bead. Beneath this layer lies a mass of fragments of sandstone, quartz, jasper, flint and granite, with great amorphous masses of calcareous conglomerate, without any indications of having been rolled there by water. It is in this stratum that the diamond is found, together with other precious stones.

The Sumbulpoor district extends to the immediate vicinity of Sumbulpoor only, in its fruitful alluvial plain, 385 feet above the level of the sea, and between the rivers Mahanuddy and Brahmini.

The precious stones which are found at the mouths of the little tributaries of the Maund, flowing from the north-east, are of various sizes and of purest quality.

In Sumbulpoor the diamond seekers are of two castes, but their origin is unknown. They resemble Negroes rather than the Hindoos. They go by the names Ihara and Tora. Sixteen villages of the poorest kind are given up to them as free Jaghirs. Ten are occupied by the Iharas and four by the Toras, the remaining two being devoted to their gods.

These diamond seekers with their families, numbering from 4,000 to 5,000 persons, migrate yearly; and from November to the commencement of the rainy season search the bed of the Mahanuddy river from Chunderpore to Sonepore, a distance of twenty-four geographical miles, scrutinizing every cleft and corner for the precious stones. They carry with them only three tools, the pickaxe, a board five feet long, hollowed in the middle and provided with a raised border three inches high, and a second board about half the size.

With the pickaxe they scrape the earth out of the clefts and holes, pile it in heaps on the bank, when their women lay the earth on the larger board, slightly inclined, wash it with water, and remove all but the rougher sand and pebbles; these are subsequently placed on the smaller board, spread out, and searched for precious stones and gold dust. They find the diamond mostly in a mass of tough, reddish clay, pebbles, a little sand, and some iron oxide. This is, indeed, the material chiefly looked for; it seems to be the debris of the same stone "breccia" as that which Voysey supposed to be diamond rock in the Pennar and the Kistna groups.

The second method of obtaining the diamond in India is to form a flat surface in the neighborhood of the place where the precious stones are to be sought, and build round it a wall two feet high, leaving here and there openings for the water to run off. The earth which has been worked out by means of the pickaxe, is thrown into this extemporized well, and after two or three washings the large stones are removed, the remnant dried, and the diamonds sought for. From time immemorial the diamonds found in this district have been claimed as the Ruler's right. The finder of large diamonds is rewarded by the royal grant of one or more small villages. For smaller diamonds there are other rewards; but for the concealment of precious stones, the natives are punished by having their villages taken from them, and are subject also to be beaten. In spite of this, and threatenings of severer pains, smuggling and concealment go on.

Since the year 1818, Sumbulpoor has been under British rule. In this year a diamond was found which weighed 84 grains, and although of only the third quality, it was sold for 5,000 rupees.

The fifth and last group of diamond beds is near Bengal, Bahar, and Allahabad, on the south bank of the Ganges. South of this mighty river there runs almost in the same direction a vast range of lofty tableland, sandstone or granite, extending 150 miles from east to west. In the eastern third of the lofty tableland there have not yet been discovered any signs of the existence of the diamond, although a mine mentioned by Tavernier must have been at some spot south of this range. In a second division of this sandstone belt, at its west extremity, and limited to a very few miles, is a spot famous since the time of Ptolemy for its diamonds. It lies very near to Panna.

In the small rivers which have their rise in the tableland, and take their course through valleys furrowed in rock, forming on their way wild cataracts, diamonds are not infrequently found, carried along with soil violently dislodged.

It is not to our purpose to pursue many of the undoubtedly interesting geological and geographical topics which lie before us at this juncture. We will allude briefly to the points which complete our particular relation, and state that diamonds are found under the cascade of the river Bagin, from 700 to 900 feet below the present diamond strata; and the only explanation of it is that the Bagin has brought these precious stones down from the tableland, with other matter torn from its native bed.

As a rule, diamonds are found 1,200 or 1,300 feet above the level of the sea, and, as Franklin observes, "when diamonds are discovered 1,100 feet away from their native bed, they must have been borne there by water."

The most productive diamond mines in this fifth group were in 1860 at the village of Sukariuh, about twenty miles from Panna. Here the upper stratum, from fifteen to twenty feet thick, had to be broken through in order to reach the rich diamond bed.

Four kinds of diamonds were found at Sudariuh. They are termed, 1st, *Motichul*, clear and brilliant; 2nd, *Manik*, verging in color to green; 3rd, *Panna*, with a faint orange tint; 4th, *Bunsput*, dark colored.

In the south-eastern point of Borneo, Tanah Laut (or Lake Land) ends the chain of mountains which runs parallel to, and on the east of, the large river Bangermassing.

The most southern portion of the mountain is known by the name of the Ratoos Range. Its highest point, 3,168 feet above the sea level, is for the most part composed of serpentine, diorite and greenstone. The diamond mines are all on the west side of the Ratoos. The soil, mostly red clay, is thirty or forty feet deep; below that, for about six feet, is a gravel or shingle of serpentine, diorite and quartz, interbedded sometimes with marl, in which are found fossils of the *Ostrea Cardium*, a still-existing mollusc in the neighboring ocean. The diamonds, accompanied by magnetite, are found in a sand-bed resting on serpentine. The surest indications of the presence of diamond are little pieces of black quartz, containing iron pyrites, and flakes of platinum. In this south-eastern province alone 400 people are occupied in diamond washing; in the north-west of the island, in Landak, diamond industry is also carried on, but under what conditions and with what means is not known.

About the year 1840, in the district of Doladoulo, in the island of Sumatra, some moderately rich diamond beds were discovered.

COLORED DIAMONDS.—GENERAL.

The collection of colored diamonds in the Vienna Museum, which

was brought together by Herr Virgil von Helmreicher, a Tyrolese by birth, but long resident in Brazil, is undoubtedly the most complete in Europe.

The following is the order in which I think these gems should be arranged, having regard to their rarity and value:

1 Blue, 2 Red, 3 Green, 4 White, 5 Olive, 6 Black, 7 Fire-colored, 8 Yellow; the remaining need not be classified.

BLUE DIAMONDS.

Diamonds occur of every hue, and according to Mandeville, "seem to take pleasure in assuming in turns the colors proper to other gems." The blue or sapphire tint is, with the exception of the ruby red, the rarest of colors met with in diamonds, and ranks among the most beautiful of precious stones.

Diamonds of a faint bluish tint are not infrequently found, but are usually more or less opalescent, and therefore rank as stones of inferior quality; whereas the dark blue diamond is of extreme rarity.

Although writers describe these stones as possessing in an eminent degree the beauty of fine sapphires, no comparison can really be instituted, their blue color being peculiar to themselves, dark, verging on indigo, possessing a fierceness in their tint, which differs materially from the mild, soft hue of the sapphire; and above all, they possess the exclusive irradiance and fire of the brilliant. It is indeed a gem, which for its intrinsic beauty no less than its extreme rarity challenges the foremost place among precious stones. The only blue diamonds known were found in the old Indian mines, probably those of Gani or Colore, visited by Tavernier in 1642.

The Brazilian mines, although yielding many colored diamonds, are not known to have produced a single specimen of the dark blue variety. The same remark applies to the South-African, which have not as yet given to the world either a green or a blue specimen.

The first mention we have of a blue diamond in Europe, refers to a stone then considered unique. It weighed in the rough 112¼ carats, was bought by Tavernier in India in 1642, and was sold to Louis XIV. in 1668. It is described as "d'un beau violet." It would appear to have been somewhat flat and ill-formed. After its purchase by "Le Grand Monarque," it was apparently cut; as we find in the French regalia a century later a faceted diamond, triangular in shape, and of the identical color, weighing 67⅛ carats, which would be about the weight of Tavernier's celebrated purchase, after cutting.

This, the only recorded blue diamond, was, with the rest of the French regalia, seized in August, 1792, and deposited in the Garde-Meuble. From this insecure place it was surreptitiously abstracted in Septemper of the same year. What became of it remains a mystery; that it should have been lost is incredible; and from the sudden appearance of a stone of similar character, the extraordinary rarity of which is acknowledged, I strongly incline towards the belief that it is Tavernier's recut, and so altered in form as to render its identification very difficult. This hypothesis, which I offer, receives additional probability from the fact that a blue brilliant about the year 1830 was in the hands of Mr. Daniel Eliason, which stone came to light without a history, without any account being rendered as to whence it came, and what had been its travels and its fortunes. Subsequently I trace it as the property of the late Mr. Henry Thomas Hope, under the name of the "Hope Diamond." The difference in weight between the original stone of 67⅛ carats, and this actual stone of 44¼, forces upon us the interrogation, "Was the weight lost simply in the cutter's hands in manipulating the stone, or were one or more pieces removed by simple cleavage and preserved?" *I* incline to the latter alternative, viz.: that the diamond abstracted in 1792 was reduced by cleavages, and formed into two brilliants. This deduction is more probable, as Tavernier's diamond evidently had one of the crystallographic faces *largely produced* on the one side, which gave the stone a "drop form." In the first cutting of the stone this original shape was to some extent preserved, which left an ill-formed triangular-shaped brilliant somewhat thin on one side. From this it would have been easy for an expert to cleave a triangular piece of about 10 or 11 carats, thus leaving a stone weighing about 56 carats, the re-cutting of which as a perfect brilliant, well-proportioned, would reduce it to its present weight of 44¼ carats. It is observable that the "Hope Diamond" is even now straighter on one side than the other, and this strengthens the presumption of the stone having been cleaved as suggested. The late Emperor of the French ordered a model of the blue diamond in question to be made while it remained in the Paris Exhibition.

It would confirm my hypothesis still further could the piece or pieces split off be discovered. The piece must at first have been triangular, having a straight side corresponding with the side of the Hope Diamond, as described above. If then we find a blue diamond of drop shape, of the same color precisely as the "Hope," having its base to correspond with the straight side of the latter, proportionate in substance, and weighing from 6 to 7 carats, we have a strong presumptive evidence that the two stones are parts of the same original, and that the smaller is a cleavage of the larger. Such a stone did actually come into the market in April, 1874. It was purchased in Geneva at the sale of the late Duke of Brunswick's jewels. The purchaser put the stone for a short time into my hands, and I examined it in juxtaposition with the "Hope Diamond." It is identical in *color* and *quality*. I know not how to avoid the conclusion that the Duke of Brunswick's "Blue Drop Diamond" once formed the triangular salient gibbosity which formerly appears to have characterised the stone now known as the "Hope Brilliant."

Besides the Hope and Brunswick Diamonds, there are only three diamonds known in Europe that can justly be termed "blue," and these all differ from the "Hope," and from each other in color. Of the three the most important is the Brilliant, also sold at the Duke's sale, a blue stone with a dash of jet in it, weighing 13¼ carats. It is of an octagon shape, with "flat top and thick back," not unlike a rose diamond.

I am myself in possession of a very fine, but small, dark blue brilliant, weighing about five grains, which at one time formed part of the Vienna Collection. The only remaining blue brilliant, beside those described, is in private hands. This stone weighs about 4½ carats, is somewhat square in form, and is paler in hue than its famous congeners.

RED DIAMONDS.

The true red diamond is valuable "acording to the glorious beauty of its perfection," to use a quaint phrase of good old Thomas Nicols, writing to the dons of Cambridge in 1651; "It feeds your eyes with much pleasure in beholding, and hence are discovered to us the excellency of super-celestial things."

The only specimen known to us is the gem bought by Mr. Joseph Halphen, of Paris, from a London firm. It came last year into my hands, and passed thence into those of a great connoisseur, who would hardly be induced to part with it.

There are rose-colored diamonds—not a few—but the blood or ruby red, such as the specimen to which I have alluded—a gem on fire as it were—is so rare, that I know of no second.

GREEN DIAMONDS.

The history of the finest specimen of a Diamond of this color may not be uninteresting. Twenty years ago this stone was obtained for £200. Some years after it was sold for £300. Subsequently it passed into the possession of a jeweler in Bond Street who parted with it to an American gentleman for £600. Mr. Charles Drayson is now its owner; should he consent to take a £1,000 it would undoubtedly be purchased for the regalia of one of the great European courts.

Patti's diamond necklace, which cost $60,000, was recently offered at public sale in Paris, and $16,000 was the highest bid made for it.

The Stopwork in Watches.

BY M. A. PHILIPPE.

YOU have doubtless heard dissertations on the little mechanism called the stopwork in a watch, which might often be called the *stopper*, for it frequently prevents watches from going. However, it is neither upon the construction nor the respective merits of the various kinds of stopwork that I wish to call attention; it is rather on the inconveniences arising from its bad application. Many watchmakers, even among the best, are convinced that the stopwork is indispensable, either to assure the perfect working of the mainspring, or to contribute to the regularity of the watches. In my opinion it is a double error, and a prejudice.

I may add that the disadvantages of stopwork have been noticed by a great many thoughtful minds, for many endeavors have been made to reform or suppress it altogether. Nevertheless, I believe that the majority of those who have sought to ameliorate or do away with it have aimed rather at a simplification of work, surety of function, and, above all, economy of manufacture. I wish to examine it from another point of view—that is, the advantages and disadvantages attached to its application, under whatever form they may be presented.

In my opinion it has only two real advantages:—1st. It protects the fastening of the spring to the drum; 2nd. It marks in winding the exact moment when to stop. Beyond these two well-defined functions I only find advantages vague and erroneous. Some assert that arresting the hand before the force is exerted on the hook prevents a too violént strain, which is communicated to the movement and the escapement, sufficient often to influence the balance. This is an illusion; the catching of the tooth which arrests the hand produces a more violent shock to the barrel than the strain on the hook in the case where the stopwork is suppressed. In both instances the force of the hand acts as if the different parts which compose the barrel were one, and as if they were soldered together; and at the same time this body will be less rigid when the force is exercised through the spring alone than by means of the stopwork. This may be easily understood by considering that the extremity of the spring hooked to the drum does not entirely lose its curve, and therefore possesses a certain elasticity capable of greatly modifying the shock. Besides, in the other case, the shock is insufficient to give a violent impulse to the balance. It is not by a shock in winding that the balance would be much influenced; it is by a sustained action. It is only necessary to examine what occurs in winding the spring; in spite of the rough and relatively prolonged force of the hand the balance often attains its maximum course only a moment after the hand has ceased its operation.

There has been attributed to stopwork the advantage of allowing the choice of the best turns of the spring for regular working. I concede, up to a certain point, the plausibility of this reasoning, but it would be so rarely applicable that I cannot bring myself to regard it seriously.

Before passing to the consideration of the best turns for a spring by the application of the stopwork, account must be taken of the properties of the mainspring. I believe this study is much neglected, and that very few watchmakers could tell the form and length a spring should have in order to be able to choose the best turns for development. The numerous experiments I have made on this matter have brought me to the conclusion that this study is only possible on very long springs; and, further, to obtain an equality of traction, I will not say perfect, but relatively superior, it is necessary to utilize at the most only two or three turns. These conditions are hardly practicable for pocket watches, without sacrificing the force and regulating power. Besides which, the most interesting for us to discover is where the greatest equality of development of a mainspring, joined to the greatest effective force is to be found, especially when it is necessary to utilize four or five turns. I have made many experiments on springs of all lengths and all strengths, and I am in a position to affirm that the greatest equality of traction is always found in the top turns, so much so that, by means of the placing of the stopwork, the more turns or fractions of turns left unoccupied in the top of the spring, the more will the difference be marked in the force transmitted to the movement between the first and last hour of going. So that this pretended property of the stopwork in facilitating the use of the best turns of the spring is completely illusory, at least as far as concerns the application of it in watches of the usual manufacture.

I pass now to the results of my experience, which may serve to show in what conditions springs work with the greatest advantage. I have many notes of different kinds of tests, some made directly on the spring by means of a graduated lever, others by placing the lever on the center of the great wheel, and notifying more exactly the differences of transmission of force; finally, some observations on the arcs described by the balance at different periods of the development of the springs. I will begin with these last, as from their nature they strike the imagination most forcibly, and are connected with the result sought to be obtained, viz.: a vigorous and extended movement of the balance, and the greatest equality possible in the extent of the arcs described. I must here notice, parenthetically, that the observation of the arcs described by the balance presents some difficulty. Owing to great practice in these observations, I can distinguish to within 5° nearly, by careful inspection, the degrees of the totality of distance traversed. Nevertheless, however good the eye may be, it is best to assist it in these experiments by a figure, the simple trace of a circle, for instance, representing the diameter of a balance of 18 or 20 lines, with its divisions of 10° to 10°, and to have this constantly before the eyes during the observation. This is not all. In order to mark exactly the highest culminating point of a balance, it is necessary to take into consideration the intermittences produced by the variations of the pitchings, and notably by that of the barrel with the center pinion. The observation ought generally to last long enough for the passage of one tooth of the barrel, usually about six minutes, according to the numbers. This precaution should be taken at each phase of the observation, viz.: the smallest and the largest tension of the spring. It is doubtless well known that, according to the pitching of the barrel with the center pinion, the extent of the arcs described by the balance may vary from 10° to 60°, and even more if the balance be very defective.

I have observed in the manner described ninety watches furnished with ordinary springs, generally designated by our Geneva makers as *free development springs*, not confounded with the *free springs* of my invention, which are a totally different article. The free development spring differs only from the common spring by a light form in point towards the center, commencing from the middle of its length. I observed these ninety watches first soon after winding, and secondly, after going 24 hours. I noted exactly the degrees traversed both above and below, then added the two together, and struck an average. This was found to be, for each of the ninety watches, a loss of 112° after going 24 hours.

I next notice thirty-six observations made in the same manner upon springs a little more marked in all their length than the preceding; these springs are weaker, for they are applied to barrels which make five turns in 24 hours. The loss gives, for 24 hours' going, an average of 90°.

We come next to seventy-two watches furnished with the same kind of springs, applied to barrels making five turns in 24 hours, but curbed. The average loss is 84°.

We shall now notice the free springs; unfortunately the observations only extended over fifteen watches; the average loss was reduced to 65°.

I shall finish these notes by the observations on seven watches having ordinary springs also in ordinary barrels, but without stopwork. The fastening to the drum is made by means of a little cross-pin, well known, I believe, and which is placed between the hook and the curved extremity of the spring. This excellent and economical proceeding possesses great security, and replaces the stopwork with great advantage, as we shall see. The average loss, after 24 hours' going, is found to be below that of the free springs.—*From the Journal Suisse d'Horlogerie.*

Proceedings of the Horological Club.

A Distinguished Body of Watch and Clock Makers.

Fifty-third Discussion.—Communicated by the Secretary.

UNSAFE WHEEL AND PALLET LOCKING.

Secretary of Horological Club:

I desire to enter protest against answer to H. P. B.'s first letter, June Proceedings, which I think is erroneous, or at least not given with proper reservation, and may have caused H. P. B. or other devotee in the cause of the Club to ru n some otherwise good escapements. Judging from his hyperbolical form of expression, "seldom find one," etc., I am satisfied that he has been testing the escapements by pushing off the lock from the outside of the fork, allowing it to fly over against the banking, which is sufficient to jar it off the lock on the other arm of the pallet, unless that lock is really heavier than need be. This leads him to suppose it had failed to lock at all. This common manner of testing escapements has, I think, been deprecated by many good authors. It represents no action that ever takes place in the watch, for when the pallet is drawn off the lock the fork drops against the jewel-pin and is let fall comparatively easy against the banking. He should place the peg-wood or other point in the slot or between the horns of the fork, and allow the impulse to come against it. Again, if the test was correctly applied and the escapement faulty, it may be entirely in the lack of sufficient draw in the pallets, with depth by no means scant; and, if it was scant, the remedy of Mr. Uhrmacher may or may not be the purely scientific mode. But if H. P. B. has read the treatise of Grossman, he will need no comment upon the relative proportion of wheel, pallet and distance of centers, etc. R. P. S.

Mr. Horologer replied, in the absence of Mr. Uhrmacher, that we are always willing to have our opinions criticised, if correspondents will give proper thought to their letters, and be sure that their criticisms are well grounded and called for. Judging from the last part of Mr. S.'s letter, he feared that gentleman had not done so.

Mr. H. P. B. had asked a plain question: whether the escapements were purposely made with unsafe lockings? To this a direct answer was given by Mr. Uhrmacher, without trying to show off any wonderful erudition or display of technical terms,—that if they acted as described, the depthing was evidently scant, an the faulty arm of the pallets should be set up closer. Mr. R. P. S. now says the fault may be lack of sufficient draw. This is a mistake, for if the escapement was correctly tested, there would be no such trouble from a lack of draw, nor even if there was no draw at all. If the locking faces were so shaped as to force the teeth off, then of course the wheel could not be locked at all, on any of the teeth; but no such pallets are to be found in the class of watches spoken of by H. P. B. He refers to fine watches in general, but mentions those of the Waltham, Elgin and Howard Companies, simply because they are well known to be made after the most approved principles.

Mr. R. P. S. also says that even if the escapement pitching was scant, "the remedy of Mr. Uhrmacher may or may not be the purely scientific mode," etc. But here Mr. S. certainly wrote without due reflection. For it is fair to presume that, in the "fine watches" of the above named companies, the "relative proportion of wheels, pallets and distance of centers, etc.," have been attended to by the makers. Their high reputations render it very unreasonable to suppose that the workman would have any occasion to remodel one of their escapements. The most that need be looked for is an accidental shifting of the pallets, which has made the depthing of one or both of the arms too shallow, for which the remedy proposed by Mr. Uhrmacher would be the self-evident one.

The mode of testing the depthing or pitching, mentioned by R. P. S., is the correct one, although he did not recollect any notable author except Excelsior who had given explicit directions on that point. That writer gave substantially the same method in the beginning of section (330), of his articles on the detached lever escapement. This method was also the one which Mr. Uhrmacher supposed to have been used, as shown by his remarks at the July meeting. Another letter from H. P. B. was here read, describing his method of testing, which turns out to be the same as Mr. R. P. S. had suspected. This probably accounts for the failure to lock, or rather to stay locked, complained of by H. P. B. in his former letter, and shows that the fault was not in the construction of the escapements in the watches of the companies named, but in the improper method of testing them. A really fine and well adjusted escapement would be more likely to fail to stay locked, when tested in the method followed by H. P. B., than would a coarse one, with the lockings two or three times as deep as they should be. The complaint against them therefore proves to be a credit to them, rather than the contrary.

TOOL FOR REMOVING SET CAP JEWELS.

Secretary of the Horological Club:

I saw something about "Removing Set Cap Jewels,' and I did not think it a very good plan to remove them with peg-wood. The gentleman for whom I am working has something very good for that use, and I will try to describe it. It is about two inches long, and somewhat like a secrew-driver, only the handle has a brass wire set in it, the end being made about the size of the jewel setting, and hollow. We have used these for quite a while, and we find them very good indeed for that purpose. Apprentice.

Mr. Waltham said that this tool would be a good one for the purpose, if properly made, to rest on the setting, and not on the jewel or the bezel over it. But a hard peg-wood point, run rapidly around the jewel, with sufficient pressure to start it loose, was equally good and safe. It would also require less pressure than one would suppose, owing to its being repeated so often and on all sides. The tool would be the more scientific way, and it was so easily made that every workman could have one or more sizes. It would also do for pushing the jewels back in their places. He was pleased to receive this item from "Apprentice, and hoped that all our readers would follow his example and send us descriptions of any little improvements or labor saving tools that are not generally used.

NEW YORK PRICES FOR WATCH WORK.

Secretary of Horological Club:

In the May number of the Circular, page 71, I contributed a brief article to the "Club," giving my experience and method of securing good prices for good work. The first and second points of the article were commended by Mr. Clerkenwell in a few very judicious remarks; but horrors on the third. In contemplation of *that* point (the getting up of the proposed price list), he imagined a prospective metamorphosis of the whole Club into as many "scape-goats for the benefit of their country brethren," (*a*) should its membership become subjected to the sin consequent upon such an act. Again, in the Circular for June, page 91, under the caption above given, in reply to correspondents concerning price lists, we are informed that the Club has no price lists, and for the reasons already given there can be no such things as price lists gotten up, that each individual member establishes his own prices, (*b*) that "they are under no obligation whatever to furnish lists to the Club, or anyone else except their own customers (points we all comprehend), and they unanimously decline to furnish them to any one for any such purposes as our correspondents want them for." This casts direct reflection of dishonest motive upon Amaltheia, as well as upon each correspondent on the subject. In suggesting the idea of a price list gotten up under the auspices of the Club, I did it understandingly; realizing that its members represent different localities in or out of the City, and that the *best* locations demand the higher rents, and incur the heavier expenses, and *vice versa*, which would necessitate a *legitimate* difference in the rates of charges. Consequently the Club members could better represent the mean average prices for artistic work, thus furnishing an approximate equitable medium of rates as a common guide to the trade, from the Metropolis of the country, than we could in any otherwise obtain. Meanwhile legitimate discounts or premiums, from prices so given would regulate themselves according to the magnitude, location, style, and refinement of places, supply and demand of artisans, etc. How many Proprietors of the Trade exist, who have not felt the *need of some means* to convince an otherwise intelligent custom which is ignorant of what ought to be just compensation for skilled workmanship, that their *charges* are not the unscrupulous demands of avarice, but the merited dues of patient artistic labor directed by *brains?* A judicious approximately equitable price list, wherever used, supplies this need. It is the *evidence* of authority

free to the trade that charges are governed by some rule of principles. It is an argument that settles a penurious customer's prejudices, and dissipates the suspicion that *charges* are individual arbitrations "because of advantage" over the uninitiated. It saves time and parley, builds up public confidence, SUSTAINS good prices for good work, and so encourages acquisitions to skilled workmanship. *Individual* price lists are a detriment to success, a self barter and safe style of business. If I make a price list, my neighbor makes one a little lower, his neighbor follows suit, and it becomes a contest who shall exhibit the lowest prices. Does such practice need disquisition to show the tendency of both the prices and the workmanship? The idea that the matter for an approximate equitable retail trade repairer's price list can't be arrived at in the city, is in my estimation a fallacy, and the little fling at Amaltheia's suggestion, the result of a misunderstanding. Below I give the heading and preamble, with the signatures to the price list I have been using. "LIST OF PRICES FOR WATCH WORK AND JOBBING.—We, the undersigned, Watchmakers of Columbus, Ohio, for the purpose of establishing uniform and equitable prices for watch work and jewelry jobbing, do hereby pledge ourselves to the following List of Prices from May 1st, 1864: R. D. Dunbar, Wm. Blynn, J. E. Luchtenberg, F. A. & L. Lesquereux, E. H. Jenkins, H. Kessler, W. J. Savage, M. & L. Kleeman." Before me also lies Hopkins' price list, "presenting a fair average of the prevailing charges" North and South, etc. With all this ado, we have no determination to argue out a price list, it was only a *suggestion*, nothing more. The thought that a handsomely illuminated list made in accordance with the principles herein set forth, would be a grand acquisition to the aspiring country workman, and an honor, saying nothing of the tribute of thanks and the small revenue it might afford the Club. AMALTHEIA.

Mr. Clerkenwell regretted that any unpleasant feeling had been created by his remarks on this subject. No personality was intended or possible, for he had not, then or now, the least idea who Mr. Amaltheia is, nor in what part of the Union he is located. He simply expressed his own views, candidly and plainly, but, so far as he knew, every member of the Club agreed with him. As to Mr. A.'s first point, marked "*a*," let us suppose this case: Mr. A. gets out a list of prices which he believes to be right and just to the workman and the customer. His rival across the street gets a copy of it, and whenever a prospective customer comes in he shows Mr. A.'s list, and says: "Now, I will do the work just as well, for one-third less than Mr. A. charges." Would or would not Mr. A. consider that he was making himself a scapegoat for his rival's benefit? Does Mr. A. suppose that city workmen wish to furnish their prices for the purpose of enabling their country brethren to show them and "cut under?"

Although it was distinctly stated that we had no price lists, and could not furnish any, several persons wrote to us to get them, which shows that some people do not pay much attention to what they read. In order to prevent any further misunderstanding, it was then stated further that the Club could not require its individual members to furnish it with their price lists unless they felt so disposed, and that they had expressly declined to do so, as stated by Mr. A. at "*b*." But there was no imputation of dishonest motives, or anything of the sort. It merely meant that they, personally, did not wish to enter into such an arrangement. If there are jewelers in this city or elsewhere who will furnish price lists, and will send us their addresses, we will fully publish them.

We fully appreciate this difficulty felt by the trade, and have given considerable time to the discussion of various remedies therefor. Doubtless many agree with Mr. A. in his preference for a New York price list, and we shall be happy to assist them in getting such, if those who have them to spare will make it known. But the speaker thought that Mr. A.'s own letter proved the fallacy of the plan. He wants a list of prices for "artistic work," then thinks that the amount of cutting under would come right of itself. We think, on the contrary, that it would enable the botches to get better prices, raise them to the level of respectable competition with the good workmen as both being users of the same standard list of prices,—while leaving the matter of individual discounts therefore all "at sea."

A customer could not tell whether A. was cheaper or dearer than B. or C., unless he ascertained the prices of each for that job, and compared them. This ignorance of prices, or rather, the knowledge that there was no regular price, would make them more suspicious and more disposed to find fault and jew down, than they would be if the jeweler should show them a list signed by all the respectable dealers of the place, and say, "Here is the standard price, which we all charge. You cannot get it done any lower, unless you go to some botch. We will do a good job for that price and warrant it. But if you have a cheap job done, you don't know what you get for your money, and may have your watch damaged besides," etc., etc.

Such are the views of this honorable body, without a dissenting voice. But we are entirely willing to allow others their liberty of opinion, and even to receive and discuss their arguments in its favor. Mr. A. has certainly made an excellent showing of his side of the case. But we do not believe that a price list satisfactory to the trade in general could be gotten up, except by putting on fancy prices, to give a chance for *cutting under*, which is the very point to which we object, as, in our opinion, not the correct way of doing business. But if Mr. A. thinks a satisfactory list can be made, why not use that of Mr. Hopkins? No doubt it comes as near the mark as any. If desirable, it could easily be reprinted in any style.

The speaker then suggested to Mr. A., if that was not what was wanted, that a committee of representative watchmakers in different parts of the country could be selected by the trade, each one of whom should make out a list as he thought it should be, and these lists be exchanged for comparison. They would finally settle upon an average, which they could then get printed, as endorsed by the trade. The whole could be done by correspondence. This matter of prices for work was one of the subjects to be considered at the National Convention of Watchmakers proposed in the centennial year, but which failed to take place. He feared that the same indifference and apathy by the trade at large, which made that proposition a failure, would also defeat every other measure which did not appeal directly to their pockets,—this one included. But, even if we believed in the possibility of accomplishing that object and its desirableness, this Club is not properly constituted for doing this work. Having no treasurer and no funds, officers who work without pay, and therefore do no more than the constitution and by-laws enjoin, and members who do just as they blank please about everything, Mr. A. must see that it would be unreasonable to expect the members to take hold of a job that went so against the grain. He, however, suggested the above plan to Mr. A. as a sort of personal peace-offering, and wished him good speed if he decided to undertake it.

HOW TO GET EXCELSIOR'S BOOK.

In reply to "Hoosier," C. F. R., "Occasional," and J. W. S., who inquire who publishes Excelsior's book, where it is to be got, etc., we would say that the first part of Excelsior's Practical Hints on Watch-Repairing, has been republished in book form under the title of "A Practical Treatise on the Balance Spring, and the Compensation Balance, by Excelsior," price $3.50, by D. H. Hopkinson, Esq., at the office of the JEWELERS' CIRCULAR, and is sent prepaid by him on receipt of the price. As the numbers of the CIRCULAR containing those articles have long been out of print, this book is the only form in which they can now be obtained. A synopsis of its contents was given in the CIRCULAR for September, 1877, showing that its title conveys but a faint idea of the great number of subjects treated, which include adjustment to isochronism, the adjustment to positions, the adjustment to heat and cold, rating, and hundreds of lesser points, of practical use to the working watchmaker every day of his life. As the Club has so often endorsed this book as worthy of all confidence, our correspondents will not expect us to repeat what we have said, but are requested to refer back to our proceedings for February and April, 1878, for full information.

REDUCING HAIR-SPRINGS.—MAINSPRING DUST BANDS.

Secretary of the Horological Club:

I have noticed a formula for reducing hair-springs in the CIRCULAR, but it is not definite enough, or finished. I will give you the method

that I have used for over 20 years with excellent success. To reduce hair-springs when they have become broken near the stud from accident or carelessness: Remove the spring from the balance—it is not necessary to take it from the collet. Then immerse in dilute sulphuric acid, in the proportion of one part acid to two parts water. Use a watch-glass, as you can see the action better. Small bubbles will form at once, evenly all over the spring, when taken out and put into spirits of ammonia to kill the acid, then wash thoroughly in alcohol. Now, to recolor, take an old mainspring barrel, plug up the arbor hole, and fill about half full of *steel* filings. I use steel because no matter how often you use them they will give the blush every time they are heated. Then place in the hair-spring and fill with your filings, put in the follower, and heat until the filings are of the color to suit, let cool, and you will find that you have to all appearance a new spring. No watch should leave the hands of a watchmaker with the regulator at the extreme end of the disc either way, but as near the center as possible, when regulated. The above method is for common watches or clocks. For chronometer, or higher grades, you must adjust a new evenly-tempered hair-spring. After one or two trials a *watchmaker* will succeed; a botch has no use for it.

Also in regard to paper dust bands. The suggestion is a good one, but I have used old pieces of mainsprings. If a person will save all his broken springs he will have all sizes necessary. Break it into pieces of the desired length, and bend it *backward* into the case, when it will fit close and be a very good protection against dirt that enters a watch through the stem or case spring holes.

I will give you soon my method of cleaning a watch, as I learned at Birmingham, England. In the mean time tell your patrons to discard benzine or naptha, and follow the advice of "Excelsior." He is my kind of a watchmaker. I wish I could express myself as well as him in writing. My best wishes to the Horological Club. If I was in your city I should try to become a member. May Heaven bless all its efforts. E. E. B.

The Secretary reported that he had received another letter from Mr. B., giving his method of cleaning cases, but would reserve it till the receipt of the remainder of his method of cleaning watches.

A HOROLOGICAL SCHOOL IN NEW YORK.

Secretary of Horological Club:

Why cannot we have a horological school in this country, as well as abroad? There are hundreds of workmen who would be glad to improve and finish off, and probably thousands who would like to learn the trade. New York is the place for it. If the Club will start such an institution, and get Excelsior at the head of it, you will deserve and receive the hearty thanks of the whole trade, and confer an incalculable benefit. I myself would like to learn all the niceties of lathe work and jeweling, and would pay a liberal price to instructors who I could feel sure were really first class. Excelsior's writings are most excellent, but what a privilege it would be to receive practical instruction from Excelsior himself. Cannot the Club manage to secure us this privilege? I hope you will try what can be done, any way. R. R. S.

Mr. Ruby Pin said he had often thought of this project, and it had frequently been suggested to him. He was intending soon to propose it himself. Such a school was in his opinion just what was most needed to elevate the craft in this country. They had proved of the greatest benefit wherever tried, and he thought it high time we had one here. Our laws did not favor long and thorough apprenticeships. A large share of our proprietors were not practical workmen, but only dealers, while another large share were not capable of instructing apprentices properly, and those who were seldom wanted to. He saw no alternative but that we must either have a school or some similar means for giving instructions to those who desire them, or else we must resign ourselves to be more and more overrun with half-taught or untaught apprentices turned loose and called journeymen, in addition to the regular crop of botches produced in other ways. The trouble was already serious enough, but from the nature of the circumstances, it must every year become worse, unless something was done to stop it. He heartily approved of the school, as not only suited to this want, but as the very best means that could be adopted to meet it. He also approved of seeing Excelsior as its head, if it could be done. That writer was so well known to the trade everywhere, that his indorsement and connection with it would at once command universal confidence, and secure abundant patronage from the start.

Mr. Regulator thought it would be wise not to undertake too much at first. The idea of a complete horological institution where one could obtain any desired instruction, practical or theoretical, was one which we hope to realize some day. But at present he thought it better to confine the project to the practical portions. In other words, it should be a large shop, fitted up with the newest and best machinery and tools of every description, where watchmakers could send all difficult and unusual jobs to be done, and also where workmen could go to see such work executed and be instructed in doing the same, with facilities for practicing in any desired branch of the trade. He would also have the instructions confined to those who already had some skill, and would therefore be able to understand and appreciate them. As Mr. Isochronal was Excelsior's representative in the Club, he would inquire of him what were the prospects of interesting Excelsior in the enterprise?

Mr. Isochronal replied that he was unable to give any information on that point. It was well understood that Excelsior's time was very much occupied by other business, and it was very doubtful whether he could be induced to give instructions in any but the most particular work, such as escapements, adjustments, etc., and perhaps not even that. He would endeavor to ascertain what could be depended on, before the next meeting. But he was confident that Excelsior would do all in his power to promote the enterprise. One point had not been touched by any of the speakers. Money would be required for starting the project, and putting it on a good working basis. This he thought could be raised by subscriptions to be repaid out of the first surplus proceeds of the undertaking.

Considerable further discussion was had, and the subject was then deferred till the next meeting, in order to receive suggestions from our readers and the trade, regarding the best course to be pursued. All who have well-considered plans are invited to communicate them.

Electro Gilding and Silvering

Of watch movements, or parts thereof, by a single and constant cell of battery.

BY P. H. MARTENS, FREIBURG IN BADEN.

THE GILDING OF WHEELS.

ONE of the most important operations in gilding the various parts of watch movements is the gilding of wheels when fastened on the pinions. It is in this case especially where electro-gilding offers great advantages over fire-gilding, as by it a wheel when fastened to the pinion and otherwise finished can be gilded without any injury to the pinion. It is merely requisite to cover the pinion with a varnish to prevent the acids of the dipping and gilding solution to act upon it.

The varnish for this purpose is prepared of five parts of rosin, two parts of yellow beeswax, and two parts of oxyde of iron. The first two parts are well mixed by melting, and then the oxyde is added, and after stirring the mixture it is poured into small and flat tin or china vessels.

The varnishing of the pinions is performed as follows:—two or three small varnish spoons are made of ordinary small file handles with brass ferrules, same as used to cement small files in, with the opening to be somewhat larger than the size of the pinion. The end of the ferrule is filed slanted so that the opening be oblong, and the end to be of the shape of a point of a spoon. Such a spoon is heated over a spirit-lamp to be hot enough to pierce into the varnish-cement, and is by this means filled with it, which will remain fluid for a short time. The pinion is now held with the left hand closely to the flame of a spirit-lamp to warm it somewhat, and then held into the spoon containing the varnish, which will easily adhere to the pinion, staff and pivot. The required thickness of the coat of varnish

cannot be obtained at once, but the pinion must after this be slightly warmed again, and the wheel turned between the fingers to allow the varnish to run equally and smooth over the steel part, and then left to cool. After this, the spoon containing the varnish is heated again and another coat of it applied to the pinion, etc., which will cover it sufficiently to prevent it coming in contact with the acids. After being sure that the steel is everywhere covered with the varnish, and taking care that the center-part of the wheel is merely covered so far as to protect the pinion, the wheel is carefully cleaned and dipped for a moment into the pickle and well rinsed. After this the frosting is performed by placing the wheel on a flat piece of cork with a hole in it to receive the varnished pinion, and the frosting powder carefully applied with a small brush, and especially taking care that not too much of the powder adheres to the shanks and teeth of the wheel, which would give it a bad appearance. The frosting, which requires to be only slightly for wheels, can also be effected by applying the powder with a slanting piece of cork of the shape as used for polishing. After the frosting has turned out to satisfaction, the wheel is scratch-brushed with the soap-powder until white and bright, and immersed in the gold solution, and treated in the same manner as the other parts to be gilded.

By new watches, when the wheels are gilded all alike, it will be better not to frost them at all, but to polish them in the lathe circular and flat, and, after varnishing the steel part, cleaning and dipping of the wheels, to immerse them into the gilding solution at once. The advantage gained by this method is that the wheels retain their sharpness better than by frosting, and further, that the depth of teeth remains unaltered. After finishing off the gilding the wheels are placed in a small pan containing oil, which is heated over a spirit-lamp until the varnish is completely dissolved; they are then thoroughly cleaned by washing, dipped in spirits of wine, and dried in fine sawdust.

ELSNER'S PREPARATION OF THE GOLD SOLUTION.

One pennyweight of fine gold after being rolled very thin and cut into small pieces is dissolved in *aqua regia* (two parts of muriatic to one part of nitric acid), evaporated to dryness, and then washed in a small quantity of rain-water and filtered. It may happen that some metallic gold remains in the filter; such may be used for a future preparation of the gold solution; then dissolve five pennyweights of yellow prussiate of potash and three pennyweights of carbonate of soda in about a pint of rain or distilled water, and boil this solution in an enameled saucepan, or in a china vessel immersed in an outer vessel of tin containing boiling water, and add the gold solution to this, when the whole will assume a darkish color, and will produce a brown precipitate, which will soon settle to the bottom if the whole is kept boiling. As soon as the precipitate is settled, the solution is removed from the fire, left to cool, and filtered. The gold solution is then ready, and can be poured into well stoppered bottles for preservation, and will not only keep well, but even improve by keeping.

REICHERT'S PREPARATION OF GOLD SOLUTION.

Take about one pennyweight of fine gold and dissolve in *aqua regia* and evaporate; wash the deposit of the evaporation into a solution of two pennyweights of soda and four pennyweights of yellow prussiate of potash in half a pint of rain or distilled water, and let it boil until the produced brown precipitate is thoroughly settled; remove from the fire, let it cool, and filter, and bring, by washing the precipitate with distilled or rain-water, the solution to the quantity of a pint, which is then ready for gilding.

By both of the above-named solutions is the application of the generally, for this purpose, used cyanide of potash avoided, on account of the same being a virulent poison, which may, through carelessness, cause mischief, but which is not the case with the prussiate of potash if used as described.

PREPARATION OF THE SILVER POWDER FOR FROSTING.

Dissolve sterling silver in as little a quantity of nitric acid as possible, and in order not to have an excess of acid, a small quantity is used to begin with, and more added when found necessary. After all the silver is dissolved, the solution is diluted with an equal quantity of rain-water, to which very small quantities of saturated salt water is added by degrees as long as a white precipitate will form. The precipitate is allowed to settle, and a single drop of the rain-water thrown into the solution. If the solution becomes disturbed, more salt water must be added, and if the solution remains unaltered, it is a sign that all the silver is precipitated. Any copper which the sterling silver contains is not precipitated by the salt water, but remains in the fluid solution, which is then poured off, and the precipitate, being the pure silver, is washed several times in lukewarm rain-water to clear it from acid, and is spread out on white paper, dried on the stove, and bottled for future use. In order to save the mixing of small quantities of the silver powder with cream of tartar and salt for each operation of frosting, it is advisable to have a quantum of the same mixed and kept ready for use. For this purpose the salt must be well dried on the stove, and then finely pounded before fore mixing with the other ingredients. This mixture will keep any length of time in a well stoppered bottle.

PREPARATION OF SILVER SOLUTION FOR ELECRO-SILVERING.

Dissolve ½ ounce of silver in nitric acid, dilute and precipitate, and wash the same, and place in a china vessel, and pour a solution of 5 ounces of yellow prussiate of potash in about a pint of water, and add to it about 2 ounces of spirits of ammonia; boil the whole for about an hour, and keep adding as much water as may have evaporated; let it cool and filter, when it will be ready for use.

Another silver solution is prepared by dissolving ½ ounce of nitrate of silver (to be had at the chemist's) in about 3 ounces of distilled water, pour the same into a solution of 1 ounce of soda and 2 ounces of yellow prussiate of potash in ½ a pint of rain water; boil the same for some time, and keep adding another ½ pint of water, when the solution will be ready for use.

The application of the silvering solution is the same as the gold solution; the silver solution should be kept in stoppered bottles.

If for electro-gilding or silvering, generally called plating, a battery of several cells is used instead of a single constant cell, then a sheet of gold must be attached to the positive electrolode for gilding, and a sheet of silver for silvering.

If in case a part of a watch, which was made to replace one, or which has become necessary to be regilded, should not match in color with the rest of the movement, the required color may be obtained by adding some of the silvering solution to the gilding solution to make the gilding of a paler color, and the addition of a small quantity of sulphate of copper solution will impart to the color a dark appearance. The various tints will soon be accomplished with a little practice.

Such mixed gold solutions must be kept separately for their special purpose, and the bottles containing the same should be labelled to prevent mistakes.

To ensure good success in the operation of gilding, it is a good plan *not* to pour the small quantities of gold solution which were used for each operation to the quantum in the stock bottle, but to keep such solutions in a separate bottle. The same will answer as a preliminary or first gilding in future operations, and the finishing of gilding may be done with unused gold solution, as by doing so the desired beautiful color will be obtained. If a gold solution has by repeated use become exhausted of the gold, another quantity of gold may be dissolved, and the deposit of the evaporation be added to the solution, which, after being boiled and a small quantity of soda added, allowed to cool, and filtered, will be as good as ever, and ready for use.—*The Horological Journal.*

THE central hall of the Swiss section in the Paris Exhibition is completely taken up with horological wares. It is very extensive and carpeted with leather. The left side is devoted to Geneva, and the right to Berne, Galois and Neuchatel. The following are the divisions: marine chronometers, pocket chronometers, complicated and fancy watches, ordinary watches, clocks. All the various tools used in the manufacture are grouped along the hall.

Indian Jewelry.

THE peculiar characteristics of Indian jewelry are well set forth in Dr. Birdwood's instructive handbook to the Indian Court at the Paris Exhibition. After giving particulars of the twisted gold wire forms of Indian jewelry, the author adverts to the chopped gold form of jewelry worn like the former throughout India, the art of which is carried to the highest perfection in Ahmedabad and Surat, in Western India. It is indeed worn chiefly by the people of Guzerat. It is made of chopped pieces, like jujubes, of the purest gold, flat or in cubes, and, by removal of the angles, in octahedrons, and strung on red silk, is the finest archaic jewelry in India. The nail-head earrings are identical with those represented on Assyrian sculptures. It is generally in solid gold, for people in India hoard their money in the shape of jewelry; but it is made hollow to perfection in Surat, the flat pieces and cubes and octahedrons being filled with *lac* or *dammar*.

After the archaic jewelry of Ahmedabad, the best Hindu jewelry, of the purest Hindu style, is the beaten gold of Sawuntwari, Mysore, Vizianagram and Vizagapatamt, which well illustrates the predominant characteristic of the native workers in the precious metals in the way in which they elaborate an extensive surface of ornament out of apparently a wholly inadequate quantity of metal, beating it almost to the thinness of tissue paper, without at all weakening its effect of solidity. By their consummate skill and thorough knowledge and appreciation of the conventional decoration of surface, they contrive to give to the least possible weight of metal, and to gems, commercially absolutely valueless, the highest possible artistic value, even in their excessive elaboration of detail, never violating the fundamental principles of ornamental design, and never failing to please, even though it be by a barbaric effect of richness and superfluity. This character of Indian jewelry is in remarkable contrast with modern European jewelry, in which the object of the jeweler seems to be to bestow the least amount of work on the greatest amount of metal. Weight is in fact the predominant character of European "high class" jewelry, and gold and silver smith's work. Even when reproducing the best Adams's design, they spoil their work by making it too thick and heavy; and so demoralising is the rage for weight that English purchasers attracted by the eye to Indian jewelry, directly they find how light it is in the hand, refuse it as rubbish; the cost of Indian jewelry being from one-sixteenth to one-fourth in excess of its net weight. The jury on jewelry at the Universal Exhibition of 1851 actually wrote of Indian jewelry: "It is sufficient to cast a glance on the Exhibitions of India, Turkey, Egypt, Tunis, to be convinced that these natives have remained stationary from a very early period of manufacture. Some of them, indeed, develope ideas full of grace and originality, but their productions are always immature and imperfect, and the skill of the workmen is called in to make amends for the inadequateness of the manufacturing process." Surely it is better to remain stationary than to fall, as they have in England, from the thin beaten silver of Queen Ann's reign, and the designs of Adams, to the present dead-weight silver and gold manufactures of Birmingham and London, for which customers have to pay four times and more than the value of their weight. The deceitfulness of its richness, its false appearance of solidity, combined with its flaunting gorgeousness and exuberance, is in fact one of the greatest charms of Indian jewelry, especially in an admiring but poor purchaser's eyes. You see a necklace made up apparently of solid, rough cut cubes of gold, but it is as light as pith. Yet, though hollow, the necklace, or whatever ornament it may be, is not false. It is of the purest gold, "soft as wax," and it is this which gives to the flimsiest and cheapest Indian jewelry its wonderful look of reality. Again, you see a necklace or girdle of gems you would say was priceless, but it is all a mere glamor of coloring; pearls and diamonds, emeralds and enamel, which "deceitful shine," and have no intrinsic value. The Indian jeweler thinks only of producing the showy effect of a glittering variety of colors, and nothing of the purity of his gems. He must have quantity, and cares nothing for commercial quality, and the flawed "tallow drop" emeralds, and foul "spinel rubies," large as walnuts, and mere splinters and scales of diamonds which he so lavishly uses are often valueless, except as points and sparkles and splashes of splendid coloring; but nothing can exceed the skill, artistic feeling, and effectiveness with which gems are used in India, both in jewelry proper and the jeweled decorations of arms and jade.

The finest gemmed and enameled jewelry in India is that of Cashmere and the Punjaub, the type of which extends across Rajputana to Delhi and Central India, and in a debased meretricious form throughout Bengal; tires, aigrettes and other ornaments for the head, and hanging over the forehead; earrings and ear-chains, and studs of the *seventi* flower; nose rings and nose studs; necklaces, made up of chains of pearls and gems, falling on the breast almost like a stomacher of gems; others, of tablets of gold set with precious stones, and strung together by short strings of mixed pearl and turquoise, with a large pendant hanging from the middle, gemmed in front, and exquisitely enameled, like all the rest of this necklace, or rather collar, at the back; armlets, bracelets, rings and anklets; all in never-ending variations of form, and of the richest and loveliest effects in pearl and turquoise, enamel, ruby, diamond, sapphire, topaz and emerald. The bracelets often end in the head of some wild beast, as in the bracelets of the Assyrian sculptures, and the plaques are often enameled at the back with birds or beasts *affronté* on either side of the taper "Cypress" trees, or else some other wide-spreading tree. The long dangling necklaces worn by the women are called *lalanti*, or "danglers," "dalliers," and *mohanmala*, "garlands (spells) of enchantment."

Pivot Drills.

BELIEVING it to be the duty of every watchmaker and jeweler to let the trade know of a good thing when it is in their power to do so, I thought I would drop you a few lines about *Drills*.

There are a great many workmen who find it very difficult to make good drills. Some of them use needles for that purpose, under the impression that they are using the best quality of steel; in this they are mistaken. Stubb's small steel wire is far superior to needles for anything required to be made of steel. To make a good drill requires care and attention; it must be filed or turned to the proper dimensions, flattened on the end, hardened, tempered, and ground to a proper shape. If the cutting angles are not properly formed, the drill will not work satisfactorily.

It is important to have a good assortment of drills, so as to be able to always have one on hand of the proper size for any job that comes along. And to be certain of having, not only a good assortment of them, but of having those of the very best quality and properly tempered, I would advise every man in the trade to get a set of "Ready made Pivot Drills." They come assorted in 21 different sizes, put up in a box containing 126 drills and two drill stocks, so that they can be used with a drill bow or in the foot lathe. They run from the small sized pivot drill up to those suitable for drilling a center hole in a Swiss watch. They are all *turned up*, the largest and the smallest are made exactly alike, being larger at the cutting angles than anywhere else—the drill part—the back of it being cut away so as to allow the drill to free itself.

I am very much pleased with the set I have, and advise your readers to send to D. H. Hopkinson, Editor of this journal, and get a set. He has the agency for them, I believe. They only cost $4.00. I found in trying to drill for a third pinion of a Swiss pendant winder that the drill was not quite hard enough. I tempered it over again, leaving the point as hard as fire and oil would make it. Then I had no difficulty. They are certainly the most complete and convenient assortment of drills I have ever seen. JAS. FRICKER.

The Eureka coin bag commends itself to persons having a quantity of silver to carry. Though it has no clasp, it remains safely closed while in the pocket, and it is impossible for the coins to slip out of it. They are made from calf-skin, Russia red; and though but about one-half the size of the ordinary pocket-book, they will hold easily ten dollars in silver.

Blue and White China

THE recent revival of the taste for old blue and white Nankin china has already led to such a rage among the "chinamaniacs" that, as we recently saw in the sale of Captain Luke's china, eager competitors were ready to outbid each other for all the choice specimens at prices quite beyond all precedent, reaching at last to no less than $6,650 for two small blue and white "Hawthorn" jars of the form commonly known as "ginger jars." Preposterous and extravagant as this seems, it is not entirely a fancy to possess something rare and curious, for nearly all these vases, bottles, jars, basins and cups are beautiful in color, symmetrical and graceful in form, and good as examples of ornamental design. They are not merely quaint and odd, like many of those objects which that celebrated virtuoso Horace Walpole collected at Strawberry hill.

Sir Henry Thompson, the eminent surgeon, who is also an accomplished artist, like some other distinguished members of his craft who might be named, acknowledges himself an enthusiast for the "old blue and white," and his collection, now exhibited, is admitted to be one of the best. Other amateurs of high repute however, are to be named among the enthusiasts, such as Mr. A. W. Franks, of the British Museum; Mr. Dante Rossetti, and Mr. Whistler, the artist. A selection from the cabinets of all the dilletanti would be a thing to see, but till this appears we have an ample display of the beauties of "blue and white" in the collection belonging to Sir Henry Thompson, which he has lent for exhibition to Mr. Marks, the well-known dealer in objects of decorative art, at 395 Oxford Street.

Several examples here are exceptionally fine, and the one pair of jars which are spoken of as the "Redgrave Jars," from having formerly belonged to that gentleman, are generally admitted to be richer and more brilliant in the deep blue marbled ground than those sold in Captain Luke's sale. A pair of globular bottles, painted with aster flowers and leaves, in excellent design, of very white porcelain, are interesting as bearing the six marks of the Ta-Ming dynasty, giving the date A. D. 1426-1436, not the oldest, but among the earliest known.

According to M. Stanislas Julien, the translator of the Chinese History of the Imperial Factory of King-te-chin, porcelain was commonly made so far back as 185 B. C., and therefore 1,600 years before it was known to the Western nations. The fine blue is thought to be obtained by the use of lapis lazuli, and the art of the process reached perfection about the end of the seventeenth century and early in the eighteenth, after that being lost and remaining inferior in quality till more recently efforts have been made to recover it, but not with complete success. A plate, No. 227, should be noticed as bearing the old Ta-Ming mark forged, being a piece of modern work. It will be noticed that the blue ground is of different shades, and in some is veined with marble with clouded shades, and in some it is plain, or what is called "powdered blue." The flowers in white are sometimes raised by the application of enamel, as in several examples. As a specimen of good latter work may be noticed No. 199—two dishes, bearing the date mark of A. D. 1061 to 1722 A very beautiful "Hawthorn" plate, No. 258, on deep, wavy blue ground, bears the inscribed six marks, signifying "a gem among precious vessels of jade," showing that it was highly prized by the Mandarin, or perhaps Emperor, to whom it once belonged. Fine as this collection is, that is of a private cabinet, there are several in Holland which have remained as they were formed when the Nankin china was being brought home by the Dutch and Portugese traders of the sixteenth century, many of whose importations have found their way to this country, as we see in the fine pieces at Hampton Court Palace, and in many old mansions. But even those who are familiar with them, and those in the magnificent Japan Palace, at Dresden, will find Sir Henry Thompson's a very interesting and beautiful collection.—*London Times.*

THE latest novelty in pottery in France is a rough earthenware, in imitation of that in use during the sixteenth and seventeenth centuries. It is made at St. Clements, in Lorraine, and is of a coarse, red body, covered with an opaque bluish enamel. It is chiefly decorated in the Renaissance and early seventeenth century styles, and the pieces already produced consist of inkstands, bon-bon boxes, and vases of grotesque shapes, such as umbrellas, baskets, etc.

Foreign Notes.

Pure silver clocks from Peru are features at the Paris show.

The entire amount of gold in the world at present is estimated at nearly $7,000,000,000 of value in United States coinage. Have you earned your share?

The lasest novelty in jewelry worn by the ladies of Paris is *L'esclavage.* It is a fetter of gold worn on the arm above the elbow, and is riveted and soldered by the jeweler, in the presence of the donors to be worn till death, or divorce, or separation. The jeweler, when the operation is over, bids the lady call next day to see that the rivet holds firmly. She comes without her friend, and the treacherous goldsmith confides to her the secret of a concealed spring, by means of which she can remove the fetter at will.

Amongst the natural products which the Turkish war should render better known to the West is the Roumanian amber. Like that from the Baltic provinces, it is a fossil resin; but while the latter is found in white and yellow shades only, the former exhibits red, pink, green, brown, and black shades, often all blended in one piece, and relieved by silvery streaks and golden specks. The finer samples have hitherto been very costly. In the Roumanian court at the Vienna Exhibition some very superb specimens were shown, all of fine color and some of abnormal size.

There is a clock at Worsley, Lord Ellesmere's seat in England, which at 1 o'clock always strikes 13. The reason is that one day the great English canal maker of the last century, the Duke of Bridgewater, to whom the estate belonged, found a number of mechanics in his employ idling about after one, when they ought to have returned to their work. Inquiring the meaning of this, he was told that they had not heard the clock strike, it being much more easy to miss hearing the single stroke than half a dozen or so. The next day the clock struck thirteen, and has done so ever since.

A valuable diamond has recently been discovered in Japan, and, like all celebrated gems, seems destined to strange vicissitudes. A keeper of a second-hand store first purchased it from a countryman for five seu—about four cents—and on showing it to a foreigner was at once offered $12,000 for it. The suspicions of the Japanese were at once aroused, and whereas if he had been offered ten cents for it, he would probably have have thankfully taken it, he saw at once that it would not do to dispose of the gem at so paltry a profit as that offered, and has handed it over to the government, which will at once test its value.

An umbrella trick has been introduced by London thieves. The operator enters a jeweler's store with an umbrella in his hand, having pulled down the silk covering, without securely fastening it, so that its folds hang around the handle and form an open-mouthed net. Into the bag thus opened it is not difficult to jerk a ring or two, or even a larger article, which will fall into it without the slightest sound. If the shopkeeper misses the treasure thus abstracted, he will run after his customer, and, as a matter of course, the other will protest innocence. A search will ensue, at the end of which the owner of the umbrella will be struck by a thought, and will himself bring to light the desired object, apologizing in the blandest way, and making merry over a joke which has so nearly, as he says, assumed a serious character.

The chief circumstance that first lead to the discovery of diamonds in New South Wales was the gold rush of Two-mile Flat, on the Cudgegong River, in 1867. Since then they have been found in considerable numbers in various parts of the colony. The forms met with are the octahedron and dodecachedron. In color they vary from colorless and transparent to various shades of straw, yellow, brown, light, green and black. The lustre is usually brilliant, but occasionally of a dull appearance. This is not due to any coating of foreign matter, but is owing to the presence of innumerable edges and angles belonging to the structure of the crystal. These reflect the light irregularly at all angles and gives the stone its frosted appearance. The plan which is adopted for washing for diamonds is first to screen the drift to separate the larger stones, then to rid it of clay as much as possible in a "tom;" the coarser portions are raked aside whilst the gold and finer matter is carried by a stream of water through the grating of the "tom" on to the blanket boxes below, where the gold and occasionally a diamond is deposited. From the material which passes over the blankets the heavier fragments are separated from the lighter by various contrivances, among which Hunt's ore-separating machine is the most in use. The heavier stones accumulate in the machine whilst the specifically lighter materials are washed away. In the heavier portion thus reduced to a small bulk, the diamonds can be readily distinguished.

Workshop Notes.

A VERY good poising tool can be made by adapting to one end of the ordinary depthing tool two new centers of steel wire, about a half inch of the inner end of each of which is filed away somewhat beyond the diametrical line. Harden and polish these ends, and they will present when properly fastened in the tool by the set screws, a very nice sharp angle on which to poise the balance; the adjustment for the length of staff is of course made by the screw which opens the tool.

TO MAKE the head of a long screw flat get a good screw head tool, the polishing disk, which is a part of it, has two or three segments of metal for grinding and polishing the head flat. While the screw is revolved by one hand, the polishing (or grinding) disk is oscillated, or "wig-wagged" back and forth by the other, so that abrading material shall not grind circles upon the screw head. On a lathe it is impossible to produce a perfectly flat head without some appliance by which a flat surface can be oscillated across the head in a place that remains constant at right angles to the axis of the screw.

TO REMOVE THE ROLLER FROM THE MAIN-WHEEL ARBOR IN CASES WHERE IT IS SCREWED ON.—This is a somewhat troublesome job unless some convenient tool is at hand to do it with. Such a tool may be made in a few moments by taking a pair of round nose plyers, and grinding or filing the points to a size and shape that will take into the holes usually made in the roller for the convenience of unscrewing it; the plyers can be opened to any distance, and fit all sizes. Place the winding square firmly in a bench key held in the left hand, then apply the points of the round plyers in the holes in the roller, and by firm, steady pressure it will be unscrewed, with no damage to any part.

A GOOD way to get an obstinate joint pin out of a brooch is to set the end of the joint on the square corner of a lead block, giving the pin a smart blow with punch and hammer; if the first attempt does not start it, set it on a fresh spot and try again. This lead block is a most useful stake to have upon the bench. A cube two inches square is easily cast, and will be in almost constant use for punching holes, driving on hands, and the thousand and one little jobs that require a firm and solid, but yet yielding support. Of course they soon get battered up, but can soon be reformed by casting in a paper box, and the corners and faces are again fair and square.

THERE are various methods for coloring gold as in Etruscan jewelry; every manufacturer has a formula of his own. The following, however, has been successfully used for some years, and has given general satisfaction. 2½ oz. crocus, 2 oz. yellow ochre, 1½ oz. verdigris, 1½ oz. copperas, ½ oz. white vitriol, ¼ oz. Borax. All to be reduced to impalpable powder in a mortar, and mixed intimately with 5 oz. yellow beeswax, or 20 dwts. saltpetre, 20 dwts. common salt, 2½ dwts. copperas, 2½ dwts. white vitriol, 2½ dwts. alum. The ingredients to be put in an old crucible and set over the fire, and the articles to be colored boiled in it until, on trial, they are found to have acquired the desired color. The beautiful satin finish is given to the class of goods called Roman gold, by carefully scratching the dead gold surface with a scratch brush made from spun glass.

HOW TO GET THE MEASUREMENT OF PINIONS, ETC.—Suppose you wish to put a new center pinion in a detached lever; the pinions, as bought, are not finished—cannot be—because the length between the shoulders is not known, consequently both ends must be finished up to order. First, chuck the pinion in the lathe, with the end exposed which is to be pivoted, and the lever faced to a finish, which may be done by measurement from the old one, which you are supposed to have. You wished to reverse it in the wax, and then finish up the other end, with the proper distance between the shoulders. Before chucking the second time, measure the distance from shoulder to shoulder of the old pinion, which we will assume to be 14° of the Swiss gauge; now measure upon the half-formed new one, the distance from the finished shoulder to the extreme of the unfinished end, which will be perhaps 22.5°; set these measurements down, so that no mistake may be made through treachery of memory; now chuck the new pinion, and proceed to finish up the measurement from the *outer* exposed extreme end; from the shoulder to this outer end you know to be 22.5°, the length required between shoulders is 14°, which, deducted from the extreme length, leaves 8.5°, as the distance from the outer end to the shoulder, which distance is easily measured by your gauge. The amount to be cut away from the leaves to form the seat for the web of the wheel can be found by inspection, or by measurement from the shoulder just found and formed. By working thus to actual measurement, you have the positive assurance that when completed it will fit at once, thus saving all the time unncessarily lost by the cut and try method of working, and saving yourself the anxiety which is an inevitable attendant upon uncertainties.

Inventions and Improvements

POTTERY dealers and silversmiths are making table garniture so that no two pieces are alike, and each member of a family can have his own cup, plate, fork, and the like to himself.

MR. J. J. PEUX, of Brooklyn, N. Y., is the inventor of an improved Crown Push for stem-winding watches, which is claimed to be so constructed as to render the crown entirely dust-proof, prevent rattling, and permit the movement being taken out of the case without removing the crown or key pipe.

MR. S. F. CHARLES, of Cumming, Ga., has patented an Amalgamator of improved construction, intended especially with reference to saving "float" gold, in which the special feature is the use of a new amalgam cloth having silver amalgam and gutta percha in its interstices, claimed to be unusually effective and durable.

A SPANISH inventor, Senor Louis Ybarra, of Madrid, has introduced a novelty in revolving firearms, consisting in the addition of a special chamber for receiving from the rear end of the cylinder a portion of the gas resulting from the explosion of the cartridge, and conveying it to one of the discharged chambers, to expel the empty shell.

AN improved Ice Pitcher, invented by Mr. H. B. Beach, of West Meriden, Conn., has an interior china, glass, or other suitable lining, strengthened by a metallic layer spun around it, and secured to the body of the pitcher by a screw bolt and nut at the bottom. While the usual air space about the bolt is left, the strengthening obviates the danger of cracking the lining by dropping lumps of ice upon it or in case of falling.

MR. JOHN COTTON, of Golden, Col., has invented a new Ore Separator, for which important advantages are claimed. It is of the "wet" type, and separates the ore by agitation over screens, placed just above the water level in a tank, motion being communicated to the water by means of suitable intermittent plungers. The tank is divided into compartments provided with screens of different mesh, so as to treat ores of varying fineness simultaneously.

MR. S. P. COX, of Brooklyn, N. Y., has patented an improved form of bracelet made of stone, jet, or other material, but especially of stone. It consists in a series of blocks or plates strung upon spring wires, having sufficient elasticity to hold the bracelet upon the arm when the edges of the bracelet are brought together and secured by a fastening similar to a butt hinge. The same inventor has also designed a locket, so constructed that no metal is visible except the eye or loop to receive the guard.

AN improvement in Dies for Forming Settings for rings, lockets, etc., is the subject of a patent recently issued to Mr. H. Henrich, of New York City. In the face of the lower die is a cavity of the proper size, having beveled edges. A block is inserted, leaving a wedge-shaped groove between it and the bevel of the die. The blank is then forced into this groove by the impact of the top die or stamp, and a setting, having an outer beveled edge and interior square shoulder, is thus formed at one operation.

MR. J. M. JOHNSON, of Yocum Station, Va., has made an improvement in pen holders, designed to render the pen yielding to pressure upon the point, and to adapt it to be carried in the pocket. It consists in arranging the pen socket in a tubular case, so as to slide freely, with a spiral spring behind the same, which tends to project the pen beyond the tube to its working position, the pen being retracted in the tubular case by means of a stud extending through a longitudinal slot in the said case, and secured by being turned axially into a notch.

A NEW PATENT REGULATOR FOR WATCHES.—Mr. Henry Thornhill, of No. 9 Maiden Lane, has invented and patented a new regulator, which cannot fail to recommend itself to practical men at first sight, embodying as it does, strength, promptness in effect and easy manipulation, answering perfectly the purpose for which a patent regulator is more especially intended, that is, for non-professionals. It seems to us that one of our watch factories will find it to their advantage to apply it to some of their watches. The following description may give some idea of its prominent features: Attached to an oversprung regulator is a toothed rack (a segment of a circle), into which is geared a worm screw (constituting a worm gear), the ends of which turn friction tight in bearing of supporting posts. On the outer end of said screw is fitted a disk, having a number of slots cut into it, by means of which a penknife, a pin, or any other handy instrument can be applied and the regulator turned either way. Its effect is instantaneous, the bearings having no end shake. The whole is made substantial and there is no danger of any derangement of its parts. Extending beyond the disk is also a small square for the use of a key or a pair of pincers.

Trade Gossip.

Pink coral is coming again into fashion.

W. B. Kinne, jeweler, Ypsilanti, Mich., is dead.

Tortoise-shell bangles, with tiny tinkling bells, are new.

Swenson & Lowry, Cresco, La., have sold out to J. Webber.

New silver combs are in the shape of a crescent and are delicately carved.

Slender gold finger rings bearing tiny coins are among the latest absurdities.

New pocket-flasks are covered with crocodile skin and ornamented with silver tops.

M. A. Sumner, jeweler, Defiance, Ohio, has been burned out. Insured for $2,000.

A slender wire of gold, with a medallion set in the center, is a novelty for a bracelet.

Rainbow glass vases are in the shape of three soap-bubbles, one resting on the other.

Silver jewelry still continues in favor, and the finest of filigree work can be found.

Semi-translucent stones are again worn, after having been out of fashion nearly ten years.

Evanson & Bredenbach, Minneapolis, Minn., have dissolved. Evanson & Northrop succeed.

Some interesting novelties are in course of preparation by the Celluloid Novelty Company.

Card receivers at the Meriden Company's are of Longwy ware, with slender silver stand and handles.

During the month of July, thirteen applicants were admitted to membership in the Jewelers' League.

It is reported that several large diamonds have lately been washed from the gravel at Myrtle Creek, Oregon.

Davis & Jennings, manufacturers of gold rings, Boston, Mass., have dissolved. Jennings, Taplin & Co. succeed.

Mr. David Dudley Field has presented the town of Stockbridge, Mass., a magnificent clock and chime of bells.

A. L. Abbot has retired from the firm of A. B. Griswold & Co., jewelers, New Orleans, La. The firm style remains the same.

The new folding mirrors are very convenient for traveling. They have three sides, and the frames are of gilt and embroidered silk.

In a window on Broadway is displayed a number of silver coins with holes and with pieces clipped off by Dr. Carver, the rifleman.

Mr. J. C. Hudson renews his engagement with Messrs. Aikin, Lambert & Co., and will shortly visit his friends with a select line of goods.

D. Leichty & Co., of Philadelphia, have dissolved partnership. Bernard Levy, for many years connected with the firm will continue the business.

A Montreal jeweler named Eaves has been arrested on an alleged charge of smuggling jewelry concealed in American clocks. The goods have been confiscated.

One of the latest and prettiest devices for a lace brooch is in the shape of the point of a peacock's feather, the colors being outlined with rubies, emeralds and diamonds.

The fashion of wearing belts is at its height, and now there are belts of silver, filigree and heavy links being the latest. Ladies might almost imagine they were wearing a convict's ball and chain.

A Geneva despatch to the *Times* says Swiss makers of fine watches have been awarded grand diplomas of honor and nine gold medals at the Paris Exposition, and an American maker has received a gold medal.

C. B. Shourds & Co., jewelers, have dissolved. A new copartnership has been formed under the firm name of Hamilton, Shourds & Co. Hamilton is from the late bankrupt firm of Hamilton, Rowe & Co.

Henry Berry, of West Meriden, Conn., has taken out a patent for a new kind of jewel casket. He claims the combination, with a frame of a box journaled therein, its hinged lid flexibly connected with the said frame, and a retaining catch.

In the window of a Bowery pawn-shop is displayed a silver tea-set, which was presented to Captain Thomas Rudd by the passengers of the steamship Union, for his skilful management during a violent passage from New York to New Orleans, in November, 1857.

J. F. Kahn, the proprietor of a jewelry store in Elizabeth, N. J., is reported to have suddenly left town for parts unknown, taking everything of value with him. He is said to have a number of creditors in this city who would like to know his present address.

The latest "test" for diamonds is stated to be "double refraction." Look at a needle point or small hole in a card through a transparent stone, and the object will appear double. This is the case with all white or colorless gems except the diamond, which never exhibits double refraction.

Silver combs with filigree designs are used with the low coiffures that are in vogue this season. Some have narrow tops and others are made to lean toward one side. Pins for the hair are ornamental balls, some are of red gold and others are of the palest yellow Roman gold, and there are massive silver pins.

A narrow bracelet of red gold presents on the upper part three knife-edged bands, decorated diagonally with three large pearls; the delicate pink pearl of the West Indies, the metallic lustre of the Panama pearl, and a pure, slightly transparent white pearl. Each of these perfect stones is set in diamonds.

Ignatius Scheon, said to be implicated with J. R. Barron in the robbery of Arthur Rumrill & Co., in Chicago some four or five years ago, has been sentenced to Auburn State Prison for raising checks on the German National Bank of New York. Barron is serving out a sentence in the Joliet, Ill., State Prison

Gold watches and chains are found in profusion in pawn-shops, and inscriptions appear on the inside of the cases of many of the watches. Among these is a watch which was presented to "J. C. M. Bjocklund, president of Svea Farening, of Brooklyn," and another "presented to James Robb, of Morrisania, by Sylvan Chapter No. 188, Royal Arch Masons."

An electric alarm has been recently designed which may be fixed to an ordinary clock. It is so arranged that when the hour hand of the clock touches a button an electric circuit is completed; the minute hand passes over the button without effect. There is a series of holes for the different hours, into any one of which the button can be pushed, according to the time at which the alarm may be desired. The completion of the electric circuit may ring a bell or sundry other alarms.

Some bronze vases of great size have been brought from Italy, which differ from others previously noticed in being constructed out of hammered plates of bronze riveted together and not soldered. The rivets are evidently of older date, since the great horn which rests beneath the Dying Gladiator is represented as riveted throughout its entire length with small nails; and there are specimens of very ancient Celtic bronze work in the museums which are joined along their edges in the same manner.

In the window of a pawnbroker's shop on Washington St., Boston, there is daily on exhibition a diamond necklace, very recently the property of Mme. Eugenie Pappenheim, who is said to have paid $10,000 for it. It was made for her to be worn as part of a stage costume, and contains 163 stones. Many of these are quite small, and all of them rather "off" color, as they have the yellowish hue which does not belong to diamonds of the first water. Its present owner advanced $2,500, and he would now take $5,000 for it, if he could obtain that sum.

One of our watch companies is about to introduce a style of watches, with a central plate of enameled gold upon or within the outer case of their watches for the painting of portraits upon them or of fancy pictures, as may be desired. This has been attempted previously, but the work has been of such a difficult character to accomplish that no artists in this country have heretofore been able to do the work satisfactorily, although it has been done in Switzerland and in France by some notable portrait painters who have made that branch of painting a study and specialty. It is now, however, being accomplished in this city most successfully and skilfully.

A fire occurred on the morning of the 3d inst., in the building owned by Michael Fitzgerald, on Friendship St., Providence, and occupied by several firms of manufacturing jewelers, caused a loss on the building of about $1,000. The following manufacturing jewelers suffered losses: Vose & Southwick, $3,000; Albert J. Smith, $1,500; Holden, Hutchinson & Heustis, $1,500; W. E. White, $600 to $1,000; Atwood & Albro, $2,000; Hall & Willis, $1,000; E. S. Dodge, $200; Arnold & Webster, $125, and S. S. Wild, $600. Messrs. Willets & Moore, manufacturers of jewelers' tools, and H. C. Luther, lapidary, suffered slight losses. All the firms were well insured.

THE

Jewelers' Circular and Horological Review.

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THE

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THE RECOGNIZED ORGAN OF THE TRADE.

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☞ *All communications should be addressed,* D. H. HOPKINSON, *No. 42 Nassau Street, New York.*

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THIS *journal is published on the 15th of every month, and will, on receipt of the yearly subscription of* $2.00, *be forwarded regularly to any address in the United States or Canada for twelve months. The present volume commenced with the February issue, and intending subscribers can be supplied with back numbers so as to have the volume complete.*

Trade Dollars.

JUST now the country is flooded with trade dollars, and the banks and business men are refusing to take them except at a heavy discount. The trade dollar is not the "dollar of our daddies," authorized by Congress last winter to be issued, which has a portrait of Lydia Thompson on one side and a turkey buzzard on the other. These last silver pieces issued by the government, are of standard value, and readily pass for a dollar. But a trade dollar is worth only ninety cents. Somebody has made a "pile" of money in the manufacture and circulation of this debased coin, and thousands of other persons have been swindled in the operation to a corresponding extent. What is the worse feature about it is the fact that the United States government has been a party to the swindle. This trade dollar is not a lawful coin of the United States. The government had nothing to do with issuing it, is not responsible for its redemption, and will not take it in payment of debts due it.

This ninety cent dollar was conceived by our "bonanza" silver men, the owners of mines that produced more silver than they could dispose of at satisfactory prices. Some of these men, holding seats in Congress, persuaded the government that such a coin would be of great service in our trade with China and Japan, and the government accordingly set its machinery to work grinding out trade dollars from the surplus silver bullion of these mine owners, charging them one and one-half per cent. for converting bullion into trade dollars, with which to swindle the "heathen Chinee." This was all the government had to do with the job, but that was sufficient to make it *particeps criminis* in the malodorous swindle. Now, like the proverbial curses that come home to roost, these debased coins have found their way back to this country in large quantities, and are drawing down upon the heads of the government the anathemas of the people. The "heathen Chinee" has in fact paid us in our own coin. Large quantities of them have been put in circulation, persons of little conscience having brought them up to pay their employees with. When these present them to the banks, they are informed that they are worth ninety cents. It is the workingmen of the country who are obliged to sustain the loss on these base coins, and they wonder what sort of a government it can be that will connive at a fraud of this character. Secretary Sherman was recently "interviewed" regarding the trade dollar, and said that "the bullion owner received them for exportation to China to give him a market for his bullion, and upon the fall of silver it was perverted by him as a means of cheating our own people."

It is a States Prison offence for a private individual to make an imitation or a counterfeit of any coin or currency of the government, yet the government for pay, lent its machinery to the silver speculators, to make a debased coin in imitation of the silver money issued by the authority of Congress. If the secret service detectives do their duty they will arrest all persons who had anything to do with this trade dollar swindle. Instead of its being of the value of a dollar, as it purports to be, it is simply worth the value of the silver it contains, about ninety cents at the time, but liable to the fluctuations of the silver market. It is, in fact, a sort of metallic shinplaster, thousands of which used to be issued by merchants, shoemakers, and others, which passed, after a fashion, for money. The fact that these trade dollars were issued to conciliate the owners of silver bullion, is a disgrace to our country, but the fact that they are now being used to swindle our industrial population, is an outrage that cannot be properly stigmatized. Doubtless Congress will, at its next session, adopt some measure to relieve the country of this base-metal incubus. Meantime, they should be refused by everybody to whom they are offered, and thus driven out of circulation, forcing the holders to melt them up into bullion again. They will sell for silver at a fair valuation, but the attempt to pass them for dollars is a contemptible ten per cent. fraud.

Retail Jobbers.

SINCE the last issue of the CIRCULAR we have received numerous letters from retailers in different sections of the country, relative to the practice we have so frequently denounced, of jobbers selling goods at retail. The ill effects of this pernicious practice are very tersely set forth by a Western correspondent. He lives but a short distance from a large city where there are several jobbers. They have flooded the country with circulars, addressed to private individuals in all stations of life (not to the trade), representing that they sell goods a little lower than any one else. One of our correspondent's customers goes to the city and returns with a watch which he has bought of a jobber ten or fifteen per cent. lower than the retailer can sell it for. He shows it to his friends, and the retailer gets the reputation of charging exorbitant prices for his goods. His

patronage falls off, and is gobbled up by these jobbing retailers, who are jobbers only in name, and in order that they may get the benefit of the jobbers' rates offered by the manufacturers. Obtaining these rates, so much below what the retailer has to pay, they can, of course, if so inclined, undersell him in every line of goods he attempts to carry. This is a gross injustice to the retailers, and is an evil which the manufacturers should do all in their power to correct. Without the retailers the manufacturers could do but little business. They are the medium by means of which the producer and consumer are brought in contact.

The jobber and retailer have separate and distinct functions to perform in placing the goods of the producer in the hands of the consumer. So long as each confines himself to his appropriate sphere, there is no clashing and there is room enough for both ; but, so soon as the jobber becomes a retailer, he is at once trespassing upon the preserves of his neighbor, and seriously obstructing the regular avenues of trade. There were formerly 10,000 retail dealers in the country where now there are less than 6,000, and one-quarter of those left are insolvent. This decimation of their ranks has been caused by the usurpations of their functions by small jobbers, to whom the manufacturers have shown special favors, and of which they have taken advantage. As between the two classes, the manufacturer must, for his own safety, protect the retailer. As a rule, these jobbing retailers are located in Western cities, and they scour the country to pick up trade that legitimately belongs to the retailers. They carry a little of everything in stock, and fit out drummers with sample cases, instructing them to sell by sample, or the samples themselves if necessary to make a trade. What they lack in stability they make up in assurance, and conscience is an unknown quantity—something entirely out of their line. Few of them attempt to give any guarantee with their wares, but palm off the good and bad according to their customer. It is stated that not much more than one-half the goods sold now-a-days reach the purchasers through the hands of the retailers; the remainder are disposed of by alleged jobbers, through auction sales, or over the counters of hardware dealers, booksellers, druggists, and fancy goods dealers. No wonder the retail trade languishes and that dealers are insolvent.

The retailers have the remedy for this abuse in their own hands if they choose to employ it. Let them taboo every so-called jobber who seeks a retail trade ; refuse to buy goods of him ; notify the manufacturers of his unbusiness-like transactions ; and, best of all, send their names to the CIRCULAR, and we will publish them as jobbing retailers who are doing their best to demoralize the trade. By these means these piratical invaders, who call themselves jobbers for the sole purpose of getting their goods at a less price and so undermine the legitimate trade, can be brought to a realizing sense of their obligations to others. It is a difficult matter, scattered as they are over a vast territory, for the retailers to combine for their own protection, but they can act individually. Let each one, without regard to the others, pursue the course we have indicated, and beneficial results will follow. Jobbing retailers are the bane of legitimate trade, and should be rooted out by any and all means.

The Bankruptcy Law

ON the 30th day of August, 1878, the last petition under the National Bankruptcy Act of 1867 was filed, and, until some similar statute shall be enacted, the relations of insolvent debtors and their creditors will be regulated by the local state legislation. The facts in this connection are interesting, and worthy of consideration. The National Bankrupt Law, which is now abrogated, went into operation on the 1st day of July, 1867, and has therefore continued some eleven years and two months. During that time 7,530 petitions were filed in this district of Southern New York, whereof no less than 604 were filed on Thursday, Friday and Saturday, the last three days of the old regime. It must be remembered, however, that many of these last day bankrupts were from the country towns included in this district ; but the mere fact that such a rush was made is conclusive evidence that the defunct law was the refuge of the debtor and not the means of an equitable adjustment of liabilities. There is little profit in a recapitulation of the many evils and shortcomings of the bygone system. It was tainted from end to end ; the debtor who took the benefit of the Act knew that he would be plucked of the majority of his available assets and made his disposition accordingly. The creditor knew that if he pursued his remedy it would be at his own expense—that good money would be thrown after bad, and that in the end the debtor, by a patient pursuance of the Fabian policy, would weary out the requisite majority, and so triumph over his victims.

The expenses were out of all proportion to the property involved, and the Registers were accountable to no one in respect to their fees. The roguery and fraud which have been condoned under cover of the dead law is incalculable ; it pressed heavily on the honest debtor and afforded infinite opportunity of escape to the rascal and the swindler. At last it is abrogated and we may hope for improvement to follow its repeal.

We have next to consider the law now applicable to this subject. In this State, the Legislature, at its last session, anticipating the repeal of the national law, enacted thirteen amendments to the then existing local law. The main provisions of the law as amended require that an "unpreferential and impartial surrender of property through a conveyance from debtor to assignee," accepted by the latter who joins in it and acknowledged after the manner of deeds, shall be made and recorded, not with a Register, but in the County Clerk's office. The debtor files his sworn inventory and schedules with the Clerk of the County Court within twenty days after the recording of the conveyance ; or, in case of the debtor's default, the filing is made by the assignee within ten days after such default. The law provides for a bond from the assignee, the proper citations to creditors, a public hearing to any one interested, to be accompanied with full examination of debtor, or books or other witnesses, a permission for compromises and for trials by jury of disputed facts, and finally for the distribution of dividends and the release of the debtor, upon proofs of a composition between the assignor and his creditor. In Rhode Island, Vermont, Connecticut, New Jersey, Michigan, Wisconsin, Nevada, California and North Carolina, the claims of creditors are discharged upon the debtor making an assignment of all his property. In Indiana, Kansas, Oregon, Maryland, Mississippi and Missouri, the debtor can assign his property, but cannot be discharged unless every one of his creditors consent. In Pennsylvania, Delaware, Ohio, Illinois, Kentucky, Minnesota, Iowa, Nebraska, Colorado, Virginia and Georgia, a debtor may make an assignment, but he cannot get a discharge except upon payment of his debts in full. In Maine, New Hampshire and South Carolina, the law permits an assignment, but the debtor is discharged only from those debts the holders of which sign the deed of assignment. In Louisiana the law allows a discharge if the consent of a majority of the creditors in number and amount is obtained. In Massachusetts, Tennessee, Arkansas, Colorado, West Virginia, Florida, Alabama and Texas a debtor cannot even make an assignment.

The present law is marked by two features. The diligent creditor, who pushes his claim to judgment and puts the sheriff in possession at the earliest moment, will be found more frequently, and much less endurance will be vouchsafed to slow payers. Every man can secure his debt by pushing his creditor to the wall, and there must be a marked increase in local litigation ; consequently weak firms will be crushed out of existence by their more powerful rivals who can clear out their stock and absorb it under a judgment, and trade will centre in few and strong hands. Leniency in business transactions, which has of late degenerated into culpable neglect, will be replaced by keen and continuous enquiry, followed by quick and decided action. This wholesome discipline, unpleasant as it may be, is sorely needed in the trade ; its influence for good will be soon felt and its benefits enduring.

On the other hand an era of so-called "preferred liabilities" may ensue. The debtor can secure certain of his liabilities at the expense of others, and a pliable assignee can put the money just where it will do the most good to the insolvent in his after career. But the man himself can be kept out of business save as "Agent," and in that capacity his credit and power for inducing credit is reduced to a minimum. He cannot compel the condonement of his offence as was possible under the provisions of the late law; nor will a release obtained in one state be sufficient to secure him against remedies taken elsewhere.

Taken all in all we have good reason to hope that the long hoped for era of better times will not be delayed but rather hastened by the repeal of the Bankrupt Act. It will be followed by a sense of relief among honest business men who are rejoiced at being rid of its evils, while it is only fair to conclude that weak and tottering firms have been swept away in the last grand rush, and that those now remaining are established on a reliable basis. In any event, the mercantile community cannot suffer more than under the past regime, and its repeal cannot but result to the national benefit.

The Afflicted South.

OUR Southern brethren are sorely afflicted by the epidemic of yellow fever, which has swept the valley of the Mississippi as with a scourge of death. In the train of the fell disease poverty and misery follow fast, and again and again comes the agonized cry for sorely needed help. The foe must be fought with care, comforts and medicines, all which cost money, and often and often the doctor is compelled to sentence his patient to death because the requisite appliances are unobtainable for want of funds. At such times the New York trade are not slow nor stingy, but deal out their wealth with a liberal hand. Many noble subscriptions have already been made, and while the need continues the supply will be sustained, even in these hard times when few of us have a dollar to spare. We would remind our readers that the undistributed balance of the fund raised for the Chicago sufferers still stands to the credit of the New York jewelers. About $4,000 were returned to the Committee in this city, and now, with accumulated interest, amounts to nearly $6,000, a right handsome sum, and which could be expended with great benefit at the present crisis down South. We would suggest that a meeting of the original subscribers be called and an expression of opinion invited. The object of the subscription no longer exists, and how could this sum be better expended than in checking the awful advance of yellow fever. Possibly the equitable aid of the law may be required to change the nature of the charity, but it would seem to us that a simple vote of existing representatives of the original subscribers would be amply sufficient to effect the desired end. The matter should be taken up by the Jewelers' Association, which is the representative organization of the trade and in every way qualified to act as the leader of public opinion. Notice should then be sent to the original subscribers, and a meeting had without delay, for quick charity is given thrice over, and ready relief remedies evils otherwise incurable. The South needs help now, and a little instantly given will do more good than a large amount tardily contributed.

WE have received the following communication from the Secretary of the New York Jewelers' Association, which is sufficiently eloquent to speak for itself:

NEW YORK, Sept. 9, 1878.

Editor of JEWELERS' CIRCULAR:

DEAR SIR—A circular has been shown to me which appears to have been issued by the "Dueber Watch Case Mfg. Co.," dated Newport (no State), referring to an act by an extra meeting of the Jewelers' Association of New York, August 24, 1878. This must be an error, as no such meeting was held, nor has the subject matter of the circular ever been brought before the N. Y. J. A.

Very respectfully yours,

H. OLMSTED, *Secretary.*

THE Gorham Manufacturing Co. are doing good work for the afflicted cities of the South. They have appealed to the sympathies of their friends, and already forwarded a large sum to Vicksburg, Miss. Let us see who will be the next to help on the noble work and send instant help. Just now every dollar donated to the South bears the face of an angel to those in the Valley of the Shadow of Death.

THE fourth annual meeting of the New York Jewelers' Association was held in the rooms at 652 Broadway, on Tuesday, the 10th September. A large representation of members attended, and the election for officers was held, when Mr. Daniel F. Appleton was re-elected as President, Mr. Thomas Slater as Vice-President, Mr. A. H. Smith retiring, and Mr. Thomas G. Brown takes the place of Mr. J. Guedin as Treasurer. The influence of this admirable organization is potent for good, and its power is extending day by day.

THE Jewelers' League continues to add to its numbers, and at every meeting new members are proposed and numerous applications passed upon. So far there has not been a single loss by death, and the society is solidly based, and so ably and inexpensively conducted by our own people in the trade, that every one who desires to make provision for his family should avail himself of its privilege and benefits. Great credit is due to the gentlemen in charge, who spend much valuable time in the interest of the members, without compensation, regarding their efforts as a labor of love.

THE Jobbers' Convention does not meet with universal approval, although a number of the jobbers have reported in its favor, and have bound themselves to be governed by its action. There are so many conflicting interests to be taken into consideration, that any lasting arrangement is regarded as impracticable. The relations between interior jobbers and retailers have never been harmonious, nor has any provision been made by the Convention which satisfactorily adjusts the case at issue. A partial understanding has, however, been arrived at, and we await further developments with interest.

THE sweet privilege of becoming a bankrupt is now debarred the people of this country, to some extent; but it is pleasant to reflect that under the State insolvent law an aspiring bankrupt may comfortably *fix* his relations, and leave the rest of his creditors to admire the mysterious workings of our modern civilization. Witness the following: the first assignment under the State Insolvent Law was made by E. Waitzfelder, Jr., importer of precious stones, to Fred'k Lewis. The deed gives three preferences: to Fannie Waitzfelder, $11,042.25; May Waitzfelder, $1,500, and Levi Waitzfelder, $3,275.14. After they are paid in full with interest, the other assets are to be distributed among the general creditors, *pro rata.*

THE Jewelers' Protective Union recently performed good service in recovering the trunk of Mr. Henry Freund, of the firm of Max Freund & Co., of this city, which was stolen from him at the Palmer House in Chicago. While Mr. Freund was at lunch, the thieves slipped into his room, broke open his iron-bound trunk, and got away with $15,000 worth of goods. The Jewelers' Protective Union was at once notified, and telegraphed to Pinkerton's Detective Agency to give Max Freund & Co. the benefits of the Union. As a result, in a very short time all the goods were recovered, and soon after one of the thieves was in custody. He gave his name as Charles Woodward, but absolutely refused to reveal the names of his confederates Woodward is not recognized by the police, but is an Englishman, and believed to be a member of the New York gang that has made a business of "snatching" the trunks of traveling jewelry salesmen. The evidence connecting him with the robbery is conclusive. His address for the next five years will doubtless be at Joliet, Illinois, and his occupation, breaking stone. The Union is to be congratulated on its success in securing his capture.

Proceedings of the Horological Club.

A Distinguished Body of Watch and Clock Makers.

Fifty-fourth Discussion.—Communicated by the Secretary.

WATCHMAKERS' TROUBLES, NO. 3.

Secretary of Horological Club:

Before going further in this subject, I must state that some of the troubles are often brought about by many of the incompetent workmen, and the result is that the blame falls upon the heads of those employing them, who, although they may wish to have everything done right, but may not have the opportunity or the time to examine if everything is done properly, often placing too much confidence in the skill of their workmen. Many jewelers employ a man who they think is a good workman when he makes a new piece quickly, or can make a watch go tolerably well for a time. Others look to the quantity more than the quality of the work done by them. Again, some men, if they find that their employers are not thorough judges of good work, and are not or have not been practical workmen themselves, will hurry through their work, leaving many things undone which should have been done, and even in some cases *botch*, to show how much they can do. This is apt to be the case when work has to be done *very cheap*. Others, also, will try to do things they are not competent to do, but, rather than acknowledge it, will often make alterations where not needed, and possibly put the whole mechanism of the watch or of its regulation out of gear, and for which the employer has to suffer in reputation as well as pocket where he guaranteed the good performance of watches sold or repaired in his establishment This of course does not apply to honest or good workmen who will not attempt to do more than they really know how to do well, or can tell if it is done properly and as it should be, but to the so-called watchmakers who know but a little more about the business than cleaning a watch in their way, and will warrant it, and some will go so far as to promise to return the money if the owner is not satisfied. No one, I think, in his right senses, will make such a promise if he will for a moment consider to what chances or variations a watch when worn is subjected, as spring or chair breaking, injury from carelessness, jerks, falls, winding the wrong way or over wound, clicks or ratchet, breaking or slipping, etc. The most that he should promise is to correct any imperfections or oversights that may have been left either by him or his workman; this no honest man will refuse to do. It is very seldom that the wearer will himself acknowledge that he has done anything to injure his watch, so that, if the person having repaired it is not a thorough expert at the trade, he cannot show and explain the reason of its non-performance, or why it does not go right. There are others who, if a watch does not perform correctly, are not candid enough to say that it was an oversight or an accident, but will state that it is from a very different cause than the real one, although I must, in justice to many, say that some workmen think they know more about the mechanism of a watch than they really do. For instance, some may know the proper actions of the escapement; others the pitching or depths of the wheels and pinions; others how to make some of the pieces that may be required, while but a few know thoroughly every different part, and how they must all work together to insure good performance, and will sometimes correct what they consider is defective, when the fault lies in a very different place. This is much more likely to be the case now that so many of the new pieces are made by machinery, and the separate ones by different workmen. I maintain that to be a good repairer to skill must be added long practice and

EXPERIENCE.

The members generally agreed with the position taken by Mr. "Experience." It is almost impossible to tell who is a really first class workman, unless they have been acquainted with him and his work for some time, to know how they stood the test. Possibly some system of practical examinations would be devised in connection with the Horological School proposed last month, with certificates stating the exact qualifications of the holders. Something of this sort was certainly much needed for the protection of employers as well as of the public.

A HOROLOGICAL SCHOOL IN NEW YORK.

Secretary of Horological Club:

Noticing in the fifty-third discussion of your worthy association the proposition to found a Horological School, and the invitation to communicate on the subject, I give, in brief, my conclusions, which have been arrived at from observations in Chicago, where Mr. Ernest Sandoz opened an establishment such as proposed by R. R. S. about two years ago, which failed for lack of support. Applicants were numerous but could not see why they were asked to pay, as such a thing was not heard of in this country. But there are many that would like instructions, and would be willing to pay therefor, but few are able to do so. That there is a necessity for more than one institution of this kind must be apparent to all when it is considered that nearly as much work is done by the workmen of this country to correct work that has been badly done by incompetent hands as there is done otherwise; and the work thus paid for by the people is a waste that would amount to more than the free support of fifty schools in each State. In view of this, I believe the founding of a Horological School to be a philanthropic undertaking, that should be supported by our Government, and would suggest that your honorable body propose to the respective authorities the necessity for institutions of this kind. CAMPANA.

Mr. Uhrmacher thought that a workman who was not willing to pay for instruction did not deserve to receive any, and he doubted whether such members would be any credit to the trade, even if they had all the instruction they wanted. There would necessarily be considerable expenses of various kinds for carrying on such an institution, besides paying the instructors, who could not be expected to donate their valuable time and services—most certainly not for the benefit of people who were unwilling to pay for value received. As for those who were unable to do so, he saw no help for it. They would have to do as everybody else did in this world—what they could not afford to buy they must go without. There was no question, however, but that a very large number would want instructions, and be able to pay for them.

As to Mr. Sandoz, he was well acquainted with him and his undertaking, and thought he could explain the reason of his failure. Mr. Sandoz was a fine workman but was not sufficiently well known to command success at the outset. But had he been able to keep it up for a year or two out of his own resources, or been sustained by moneyed friends, his enterprise would then probably have become self-supporting. Lacking these essentials he was in a manner compelled to fail.

But it was not so with our present project. "Excelsior" was so well known that there would be no difficulty in securing all the students who could be attended to from the very start. He had been prominently before the trade for several years, as an instructor in all the finest and most difficult branches of horological science and work. There was hardly an intelligent and reading watchmaker in the Union who had not at some time read some of his writings or heard of his skill. The knowledge that "Excelsior" was at the helm would at once satisfy all, and give confidence not only in the value of the instructions, but in the stability and permanence of the enterprise itself, and the responsility of its conductors. He was not the man to allow his name to be used in connection with any institution that was not well considered, well sustained and well managed, and any inducements or promises put out under his sanction would most certainly be fulfilled to the letter. The only questions which workmen would therefore have to decide would be, How long can I afford to stay? When can I best afford to go? What particular branch of instruction had I better take?

Mr. Uhrmacher added he could not agree with "Campana" as to government aid. It could not be expected, and he did not think it desirable, nor would it be consistent with the spirit of our institutions in this country. Even if there was any prospect of securing government subsidy, it would require, to get it, an expenditure of time, energy and influence which would of itself be sufficient to give it a start. He thought that it should be a private enterprise, conducted on practical business principles, in such a way as to afford the best of instruction at reasonable rates, while paying the instructors properly, and giving the managers, or stockholders, or whatever they might be called, a fair return for their outlay and trouble. How all this could be secured was a subject for discussion.

Mr. Isochronal, who entered at this moment, stated that he had just received a note from "Excelsior," which he handed to the Secretary to read, as follows:

My Dear Mr. Isochronal:

In reply to your inquiries regarding the Horological School, I am sorry to say that it will be impossible for me to take any active part in giving instructions. My time is so limited that I have often felt as if I should be compelled to give up even the writing of *Practical Hints*. Frequently it has been only by snatching odd moments, that should have been given to business, that I have got out those articles in season. But this movement has my hearty sympathy and approval, and can always command my best counsel as to its management, etc. It will not be difficult to find workmen competent to give instructions in the different branches of the trade, after a satisfactory plan of organization had been agreed upon, and the necessary financial backing guaranteed.

With many thanks for the kind expressions of esteem and approbation by the members of the Club, and wishing you speedy and full success in your efforts, I remain, very truly yours, EXCELSIOR.

This letter so completely "stumped" the members that no one was prepared to suggest what to do. Although it was no more than might reasonably have been looked for, under the known circumstances of the case, yet it was not really expected, and the disappointment was extreme. All had so confidently connected "Excelsior" in some way with the scheme, that when this reliance was taken away the aspect of matters was entirely changed, and the subject was accordingly postponed, in order to receive further suggestions from our readers and the trade.

HAS A HARD TIME OF IT.

Secretary of the Horological Club:

I often wonder if all watchmakers have the same experience that I do in watch repairing; and if so, do they have any rule by which they are able to suit all classes of customers? If there is none, then I think watchmakers are the most abused set of men in this land of liberty and silver money. When I commenced business I made it a rule that I would never slight or overcharge for my work, and would always try to have the watch leave my hands in better order than when I took it. But I find that will not work. Many of my customers think they know more about watches than I do; and if I tell them what I think is needed, they do not hesitate to contradict me and tell me what to do. I will give you a little of my experience, and perhaps you or some of your readers will be able to advise me. A customer brought his watch for a mainspring. I took it down and found it very much out of order. I saw the owner and told him his watch would not keep good time after I had put in a spring; that it needed cleaning, some of the pivots needed refinishing, and the holes bushed. He said: "I know better; all it wants is a mainspring, and all I expect to pay you for that is one dollar." A few days afterwards a friend calls on me and asks, "What did you do with his watch?" I tell him. "Well," he says, "that is queer; he told me he left it with you to put in order, and you spoiled it so that he had to take it to another watchmaker and pay him five dollars to do the work he had paid you for doing." Then I thought it was better for me to put the watches in order, even if I did not get pay for it. My next customer has a Jurgensen, and he wants it made to keep as good time as when it was new. I find a broken balance jewel and balance pivot cut nearly off. I put in a new jewel and pivot and take great care to have it all right. The owner calls for it; I tell him what I have done and the price. He says, "You are just like all other watch tinkers, a regular swindler. All the watch wanted was cleaning, and you know it. I will pay for cleaning it and no more." Rather than have trouble with a wealthy and influential man I take what he gives me and say all right. Another is a noted lawyer, who works hard for his money, *of course*, says he has heard of my success as a fine workman, and as he has a very fine watch, has brought it to me, and wishes me to make it all right. I do so and suit him. Then he brings his boy's watch, which I examine, and tell him that the cost will be six or seven dollars to put in good shape, and is hardly worth it, as I can sell him a new one like it for ten dollars. But he wants it repaired. I repair it to suit, and he is so much pleased that he brings his wife's, which has given trouble. Says he thinks he shall have work enough to keep me busy for a month, at least, I do so well. I think that now I have a customer who does not *grumble*, I will work cheap for him, so I repair his watch, a fine stem-winder, clean mainspring, jewel and end stone, for which I only charge him $3.50. When he comes for it he says, "I did not expect you were going to charge me any such price as that. I have never paid over $1.50 before, and think that more than its worth. I think you expect to get rich in a few weeks. If you insist on that price I shall pay it, but shall take good care never to get in your power again, and so far as possible, shall keep my friends from this 'Peter Funk' establishment." By this time the old Adam gets the better of my judgment, and I tell him if he brings his work to me he will have to pay for it. He pays for it, and his parting shot is that he will never darken my doors again. Soon I have another who has a watch that has been in the family for over sixty years, and has always kept perfect time, has not been cleaned for eight years, and dropped in, thinking it should be cleaned, and wishes to know what I charge. Does not like to go shopping around, and does not want to pay more than the usual price. Is willing to pay a fair price for value received, but times are hard, business dull and money scarce; that "half a loaf is better than no bread." I manage to squeeze in here that my price for cleaning is two dollars. That is too much—all he paid when gold was two hundred. Everything is down now; does not want to beat down my prices, but feels as though that was exorbitant. If I will take it and put it in good order and warrant it for two years for one dollar, he will think it over, and perhaps come in and leave it in a few days; that others have offered to do it for a dollar, but I seem a candid sort of a man, and thinks he would rather trust it with me than with some others who might steal out some of the jewels and put in poor ones, as many of them have a way of doing, and is sure I would make money at that price even; and he will use all his influence to have his friends bring their watches to me. I do not promise, *and he leaves me to starve*. Another wants a hand on his watch while he waits. I proceed to fit one, and, as it fits close, I lay the movement on a block and drive it down with a punch. At the first blow with the hammer he sings out, "hold on there; give me my watch. I do not allow any one to hammer my watch. I will take it where they know their business." I try to explain, but its no use; he will not listen. So off he goes, muttering curses on my stupidity. Another leaves his watch to have it cleaned. I do that and find several jewels cracked, but think, as it is a cheap watch, I will let it go and take the risk of its stopping. When the owner calls I tell him how it is. He says I had no business to let it go if the jewels were broken; it was my duty to replace them, and gently hints that if there are any jewels broken it is likely I broke them in hopes of getting another job. Another customer brings a French travelling clock, strike, repeater, calendar and alarm, and, as it is badly out of order, wants me to take it, clean and do all needed repairs for the munificent sum of three dollars. I hesitate at the price, when he says, "Oh, never mind, I can find plenty of *good* workmen to do it at even a less price. I brought it to you out of charity." I would like to know how my brother watchmakers get along in similar cases? Do they all keep their temper? READER.

Mr. Horologer thought that "Reader" must live in a queer place, or else he must be very young, or noted for want of backbone, otherwise customers would not come to him and play such games. He thought the best and perhaps the only way to get along with such customers was for the workman first to understand his business thoroughly, then to make his customers understand that he, not they, was the judge of what was needed to be done. Also, to have fair prices for repairs, and to make *all* pay those prices, no matter whether they wanted to or not, and no matter what their "influence," etc. If they won't pay the price, after you have explained the repairs and that it is a reasonable charge, let them leave their watches till they change their minds. If they refuse to pay, and take their watches without permission, don't sue them for the amount, but arrest them for stealing. A few such examples will show the public that you believe you are right and will not submit to being imposed upon, and you will have but little more trouble. Even the mean customers respect a man more for being a man, than one they can run over and abuse as they please. Every fair man will be willing to pay a fair price, and as for the other kind, you are better off without them.

In all this there is no need of showing or feeling the slightest ill-temper. Do it all coolly and politely, but firmly, as a matter of business, and as a man who understands his trade, who has done a good job at a fair rate, and who now expects and means to have his pay.

Above all he advised "Reader" let no job go out of your shop till it is paid for, to the last cent. If you trust for the last 25 or 50 cents, you will lose your money and customer too. Put up a sign, "Positively no work delivered until paid for." Or, like one he had seen, "All work must be paid for on delivery. We make no exceptions to this rule, for rich or poor." Then *stick to it*. If you advertise not to trust anyone, then do trust some, you prove yourself a liar and a trickster. No one has a right to find fault for not being trusted if that is the rule with all, and he seldom will. But if you refuse one man, and then he sees you trust another because he is rich, you may count the former as your enemy ever after. Put up your sign so that all can see it when they leave their work, then stick to it honestly, and you will have little trouble. You can afford to lose a few deadbeat customers, and have the cash in your fist for what you do. A man had better do $15 a week and get his pay than do $30 worth and only get $15 for it, and have half of his customers go back on him.

Of all things in the world, watch repairing ought never to be trusted out. A watch that is not paid for never runs well, never gives satisfaction; there is always some excuse for not paying, and the owner will in a majority of cases avoid you and go to another shop to get rid of paying. But if paid for, he has an interest in keeping on good terms, so that you may keep good the warrantee he has bought. He goes to your shop, you have a chance to rectify any little thing for; him that keeps him good-natured, and you get his work again. If you have a good customer, who has not the money with him, and you want to let him have his watch, lend him the money to pay for the repairs. You will then adhere to your rule not to trust for work, and he will owe you for borrowed money. Sometimes this has to be done, but should be very seldom. There are exceptions to the foregoing remarks, but they are the rule. The practice of trusting out work is one of the great evils of our trade. A lack of back-bone is another. Watchmakers who know that they are competent and honorable should not submit to the imputation of stealing jewels, or any other dishonest trick. If every one would resent such insinuations as they should, such talk would soon be stopped. But so long as they submit to being called thieves, rascals, etc., so long will the public very naturally believe they are so.

LETTERS FOUND.—NOTICE TO CORRESPONDENTS.

The Secretary reported that he had received from the Editor of the CIRCULAR several letters intended for the Club, which had been overlooked in his office, and only found on assorting over papers received during several months past. He would take this occasion to repeat the advice to correspondents published in previous numbers. Direct all letters intended for the Club to "Secretary of the Horological Club," *not* to the Editor of the CIRCULAR. Do not write letters for the Club and for Mr. Hopkinson on the same piece of paper, but make a separate letter of each, although both may be put in the same envelope and the envelope addressed to Mr. H. Write only on one side of the paper; write plainly; send in early, so that they will reach here *not later* than two days before the end of the month, in order to be included in the Proceedings in the next month's CIRCULAR. By observing these directions, particularly the first, mistakes and delay will be avoided. Otherwise they are liable to be overlooked or mislaid and forgotten; the Secretary has to strike out the business portions, change the heading and address, correct the spelling, arrange the copy for the printer, etc., etc.

The letters were then taken up in their order and answered, although somewhat briefly, owing to their number.

ELECTRO-PLATE AND ROLLED PLATE.

Secretary of Horological Club:

What is the difference between heavy electro-plated and rolled-plated goods? Can they be made to wear equally? Please also be kind enough to state if burnishing is the last finish given to such goods, or if polishing with buff and rouge is the final process. G. S.

Electro-plate is deposited by the battery, burnished and rouge-buffed to get high finish. Rolled-plate is a thin sheet of gold welded on a piece of composition and rolled to desired thickness, finished by polishing and burnishing. Rolled-plate will generally be harder, and bear wear better, although electro-plate can be made nearly as hard by proper burnishing after the different coats, during the plating process.

CLEANING JEWELRY.—DRILLING GLASS.

Secretary of the Horological Club:

Will you please be kind enough to let me know through the JEWELERS' CIRCULAR how to clean jewelry after hard soldering it? I used to put it in acid, but it takes a long time to get the white color off. Also, how to bore holes through glass, for instance, eye-glasses. N. N.

Mr. Rolliver replied: If you use McLane's anti-oxidizer the jewelry will not get white. A piece of copper wire the shape of a drill, a little smaller than you want the hole, and fine emery with oil or water, will drill glass.

MAKING GOLD AND SILVER WIRE.

Secretary Horological Club:

Will any member of your honorable body please inform me of the best method of breaking down gold or silver to make wire of it, commencing with the metal as it leaves the crucible, describing the kind of ingot employed, and the whole process until it is completely broken down; also the most economical gold to purchase for manufacturing purposes, if coin, or to buy from the assayers. J. D. S.

Mr. Drawbench said that the gold or silver should be poured into a wire ingot so that the bar will be as nearly square as possible. Roll it in the wire mills as much as it will bear before annealing. Heat twenty minutes and cool it as suddenly as possible in cold water. After the first annealing you must anneal gold quite often. Roll it cold. But silver will roll best hot. There is not much difference which kind of gold you use, as far as economy is concerned.

SEPARATING SILVER FROM SOLUTION.

Secretary of Horological Club:

Will you please give in your next number in detail the best process for separating and refining into crystal the silver that is left in solution after the gold has been separated, in the process of refining gold and plated scraps. P.

Mr. Rolliver advised Mr. P. to follow the process of precipitating the silver as chloride. Put your acid solution into a flask or stoppered bottle, with about four times as much water as you had solution. Make a saturated solution of common salt in water, and add this to that in the bottle until it is supposed that something very near to complete precipitation is effected, that is, as long as the addition of the salt solution is seen to produce a free precipitation. Then stopper the bottle and give it a vigorous shaking, which will condense the chloride and it will settle, leaving the liquid quite clear. The salt solution is now to be added very sparingly, shaking and settling after each addition, till no more cloudiness is produced by a drop or two of the salt. This care is necessary to avoid waste, as an excess of salt will redissolve the precipitated chloride of silver, which would then be thrown away in the wash water. The process works still better if the solutions are heated to about 150° Fahr. in the flask The solution being fully neutralized by the salt, vigorously shaken and well settled, the clear liquid is carefully poured off, and the chloride washed several times very thoroughly with water, at first containing a trace of nitric acid, then with water only. After the first settling, the chloride is transferred to a small porcelain crucible or glass dish, in which the washings are performed, heating the vessel gently before pouring off. When thoroughly washed put this chloride into a crucible and melt as usual.

COLORING SILVER.—DIFFERENCE OF TIME.

Secretary of Horological Club:

Is there anything to give silver the same looking color as platina? And can I get a list to see the difference in time between New York and other large cities in the United States? A SUBSCRIBER.

Mr. McFuzee stated that *Appleton's Railroad Guide* has a table of difference of time for the United States. There was also such a table in the CIRCULAR a year or so ago. There is no way to give silver the color of platina, except to alloy it. The nature of the alloy will have to be found by experiment. The silver could be electro-plated with platina, when of course it would have the right color.

REMOVING STONES FROM THEIR SETTINGS.

Secretary of Horological Club:

Mr. Rolliver's reply to W. S. in regard to hard soldering stone set rings is good so far as it goes, but he or some other member of the Club will greatly oblige by stating how and with what kind of an instrument stones are removed from close settings. E. P.

Mr. Rolliver said where you cannot lift up the setting from a stone with a knife or some sharp instrument, you must cut the metal away that covers the stone. If you can get at the back of the stone most stones will bear pushing out. We sometimes take stones out with a wax stick, which is made with beeswax and lamp black. Wipe the stone very clean, apply the wax and pull quick.

EXCELSIOR'S WRITINGS.—TREATISE ON ESCAPEMENTS, ETC.

Mr. Isochronal replied to "Center-wheel," who inquired if any of Excelsior's writings had been published in book form, since his Practical Treatise on the Balance Spring and the Compensation Balance, that they had not, but probably would be on the completion of the present series of Practical Hints.—To "Hair-spring," that there is no "English book published on all the different escapements." Excelsior's Practical Hints contain the best description and practical directions; they were published in the CIRCULAR. Saunier's Modern Horology is an excellent book, but it is in French, price $9, gold. An English translation was begun, but he did not know whether it would be carried on or not. R. G. and "Buck eye" inquire the price of Excelsior's book. It is published by D H. Hopkinson, Esq. Price $3.50, sent by mail post-paid. H. H will find the Club's opinion of the book in our Proceedings in the February, April and August, 1877, numbers of CIRCULAR.

The Club then adjourned for one month, leaving several later communications unanswered, but will be attended to at the next meeting.

The Stopwork in Watches.

BY M. A. PHILIPPE.

WE have seen that the marked relative equality in springs deprived of stopwork is due to the rubbing of the blades one against the other, and I have at the same time noted the dangers of too great a friction ; this inconvenience may, however, be completely avoided by the means which I shall indicate further on.

All experienced watchmakers know that the springs destined to work with a fusee are so formed as to obtain the detachment of the blades, in working from top to bottom of tension. In effect, a spring can be disposed in such manner that all friction of the blades will be obviated. In this state, according as the spring is more or less formed in point, it will present the greatest irregularities of force from the first to last turn. The mission of the fusee being to equalize the power transmitted to the wheelwork, a power constant, exempt from perturbations arising from the friction of a mainspring of rectilinear form, or of equal thickness from one extremity to the other, may be obtained. The suppression of the fusee has caused the first-mentioned form to be abandoned, and one of equal blades, or a little thickened at the center, to be substituted, as I have already remarked of those made in Paris upon Vincent's method. An error has doubtless been made in abandoning the primitive principle of springs applied to fusees; it is necessary to point out how far this measure can be preserved. The fact is that it should be applied with some reserve; that is, in a less proportion with the toothed barrel than with the chain one. The above-mentioned form is requisite to prevent the catching so frequent with blades of equal dimensions from one end to the other. A second condition is necessary; it is the check placed behind the hook—the thing, though old has lost nothing of its value. It is surprising at the present day, when so many improvements have been effected, the application of this small article, so modest and useful, should be neglected, as it adds not only to the regular developement of a mainspring, but is an auxiliary to its force. I do not fear to affirm that in every barrel not provided with a check, its motor force may be sensibly augmented by the addition.

Before going further, I will recapitulate the two points I have noted; that is, in order to prevent the catching of the blades, it is necessary that the spring be lightly tapered, and that it be provided with a check. In this condition the stopwork may be dispensed with, the hook not being exposed to damage; however, I think it preferable to apply the stopwork, in order to weaken the blade, and also because of the possible hesitation of the hand during winding, the resistance not being sufficienfly strong.

There remain two methods of dispensing with the stopwork. The first consists in the use of the little check of which I have already spoken, and which has the advantage of producing a sufficiently rigid resistance, and at the same time a retroactive effect, to hinder the too complete adherence of the blades when the winding-up is complete. If care be taken to employ the form described to springs, this adjustment will procure all the security desirable for arresting the hand, and a very great constancy in the transmission of force.

The second method is the use of the free-spring. On this subject I beg a little indulgence for the convictions of the inventor, who, spite of the small practical success obtained by his invention, still believes in its excellence. With the exception of our house, the use made of this article, the factor of a motor force more regular than similar ones, is rarely to be met with, except in very cheap watches.

The spring designated by me "free-spring" is well known. I have so named it because it develops more freely than others, and also, not being fastened to the drum, it can be turned indefinitely during winding. I shall not now stay to explain this spring. Professor Thury has given the result of comparative experiments made with a going movement, to which he alternately suited two barrels; one having an ordinary spring and the other a free one. He showed the superiority of one system over the other as regards equality of traction I have some experimentive materials and a great number of notes, tending to elucidate this question, which I should be glad to show to those whom it may interest.

We have seen the importance of the check to mainsprings; as, first, it assures its firm connection to the drum ; secondly, it procures much greater force; thirdly, it equalizes the development of the useful turns; and fourthly, it hinders, or at least lessens, the friction of the blades. In presence of all these advantages, is it possible to understand its neglect, especially in the case of superior watches? I know that one objection to the use of checks to springs is that when they have to be taken to pieces for cleaning, the repairer does not take the trouble to replace them. But this objection is not sufficiently proved. To those, however, who believe in the disappearance of the check under the hands of the repairer, I will point out a substitute in the free-spring. It offers all the advantages of the other, without the intervention of that little article so easily lost, and somewhat difficult to fix. In advising the use of the free-spring I do not counsel the suppressing of the stopwork, if it is not thought desirable. I believe that its use simultaneously with the free-spring has the advantage of preventing the tension of the strengthened end, which sometimes happens when the person winding does not stop suddenly the moment the click is heard, or when this strengthened end, left too long, drags with force against the sides of the drum. It is not necessary, when applying the stopwork to the free-spring, to make several channels in the drum; one is sufficient. When the spring is all rolled on the arbor, and has produced the sound indicated, it is sufficient in fixing the stopwork to leave one-eighth of a turn, to assure the position of the strengthened end. The stopwork being placed at this point, nearly all the turns will be available in transmitting the force. I repeat, this spring, employed in this manner, will advantageously replace the spring with a check ; the stopwork only assures an invariable tension at the moment of winding, and thus preserving to both their respective advantages.

Several times when I have noticed a weakness or insufficiency in the going of a watch, and have fancied it due to the bad working of a mainspring, I have replaced the latter by a free-spring, preserving at the same time the stopwork ; and I have always been satisfied with the substitution.

In concluding this article on the properties of the stopwork, I have drawn attention to certain prejudices regarding this little mechanism as indispensable in a good watch. I believe I have shown that it may very well be dispensed with, and that in any case it is only necessary to apply the article pure and simple, and that unless properly made it may give rise to serious inconvenience.—*Journal Suisse d'Horlogerie.*

A Remarkable Clock.

A MAGNETIC clock, invented by Daniel Drawbaugh, of Milltown, Cumberland county, Pa., is sufficiently remarkable to be worth description. The magnetism of the earth, an inexhaustible source of power, is made to oscillate the pendulum; and the simplicity of all the works gives an assurance of the least possible friction. At a certain point the movement of the pendulum itself shuts off magnetic connection with the earth, and at another point restores the connection, thus securing the conditions necessary to produce its oscillations. The works are so ingenious and simple that it is no wild assertion to make that, were it not for the unavoidable wearing out caused by even the smallest amount of friction, the clock would run as long as the solid earth endures. This clock is hung against a board partition, with all the works exposed subject to the jarrings of machinery and obstructions from dust settling upon it, yet since March 1, 1877, it has been running continuously and uniformly, with only slight reported variations, as tested by transit observations at noon.

Practical Hints on Watch Repairing.

By Excelsior.—No. 42.

EXAMINING THE DETACHED LEVER OR "ANKER."—CONTINUED.

(653) As a general rule, when a pivot is cut, rusted or worn, it should be turned down till the grooves are turned out, then repolished, and the jewel or pivot fitted to it. But in some cases, when the injured part is not near the shoulder, the end-shake can be so confined as to bring the wear upon the sound and full sized part of the pivot. In others, when this could not be done, or not without making the end-shake too tight for safety, or when turning it down as described would make it too small and weak, or when it would be too much trouble to fit in a new jewel, etc., it is better to put in a new and perfect pivot at once, of the proper size. Before taking off the old pivot, see if it is concentric or central with the pinion leaves and arbor, and particularly with the inclined corner of the pivot-shoulder. If it is not, it evidently would be an error to center the pinion, for drilling, from the arbor or the shoulder. It should be centered from the still perfect remnant of the pivot, after which the old pivot can be filed or stoned off and a true center marked. Those who use the dead center lathe must either turn a true incline on the shoulder, from the perfect stump of the pivot, stoned off straight across the end (which is the better way), or, stone the stump down nearly to the shoulder, and straight across, then mark a center by the eye, putting the point of a very tapering and sharp countersink as near the center of the stump as can be seen, with the glass, lightly at first, and when satisfied that it is right cut it in deep enough for a guide to the drill. Then drill it in a straight-line centering and drilling tool.

(654) All pivot holes should be examined, and particularly those where pivots are found cut, to see if the holes are properly polished, round and sound. A dead surface like that of ground glass is not polished, and any hole with such a surface should be properly polished before fitting in the pivot, else the new one would soon meet the same fate as the old. For directions, see article on jeweling, to follow. Be sure to clean every particle of the diamond dust out of the hole after polishing, before trying your pivot in it, as the small bits would become imbedded in the steel, and form a diamond file, which would cut the jewel hole out and ruin it. Nor should diamond or emery ever be used in grinding or polishing pivots, or any other metal bearing surface, as more or less of it will be forced into the metal, and will infallibly destroy any surface it rubs upon. When the hole is not round, or is scaled out or is otherwise damaged, a new and perfect jewel should first be fitted in, then the new pivot fitted to that.

(655) All jewels should be examined to see that they are also tight in their collets or settings. Test this with a point in the holes, both above and from below. By holding the movement perfectly still in a position in which the jewel reflects light from its surface to the eye, the slightest looseness will be shown by cutting off the reflected light, either wholly or partially, when the jewel moves. If a jewel is found to be loose sideways, and you cannot fit in another a little larger, to fit the bezel properly, first try it with the pinion in the movement, to see how the jewel should stand to hold the pinion vertical; then burnish down the setting or bezel, to hold the jewel in the center, or at one side of the setting, as may be required to make it stand as above noted. A good way, if one has a perfect universal lathe, is to fasten the plates together, mount in the lathe, centering from the tight jewel, which should "upright" the other jewel hole. After moving the loose hole to the center of revolution, very carefully advance the burnisher with the slide rest, allowing it to touch only the "high parts," till the whole bezel has been brought concentric with the jewel hole. But there is considerable risk in this method of burnishing—both of breaking the jewel and of wearing off the bezel entirely by the pressure of the tool, owing to the considerable force used. A safe way is to use simply a stout and stubbed German silver pin-tongue, mounted in a handle, commencing with holding it vertically, and finishing with it inclined—holding it in the hand. If well polished and judiciously used, this little tool will answer every purpose.

(656) But if burnishing will not make the jewel firm and secure, or if the bezel is very thin and weak, or partly torn off, it will not be safe to leave it so, as any strain or jar may move the jewel out of place, and cause the pivot to bind in it. The correct remedy is to knock out the jewel, turn out the old bezel entirely, plug up the hole flush, and cut a new setting which will hold the jewel closely and firmly. But in many cases this would be more trouble than would be justifiable, and cement may be used to strengthen the bezel. Apply heat enough to make the cement run into the fine creases and adhere well, but not to burn it. Care must be taken to keep it out of the pivot hole. A good way to prevent this is to plug up the hole with the pegwood, running the point in the hole, then cut it off, leaving the stick in. After flowing the cement, and just as it is getting hard, pull out the plug. When cold, clean off the surplus cement, but leave it on the edges of the jewel, and over the bezel. All jewels should of course stand horizontal with the surface of the bridge or plate. It is of little use, however, to give this rule, if the pivot is to be twisted out of vertical afterwards, by moving the bridge, as many do in the effort to change a depthing thereby—a proceeding not only not workmanlike, but generally not successful.

(657) The freedom of the pivots in their holes must be looked to. Pivots may be too closely fitted as well as too loosely. They must have a little play to allow for imperfections in even the best of human workmanship, for accidental springings of the parts, for pivots not perfectly upright, and jewels not perfectly horizontal, for both pivots and jewel holes not perfectly round, for pivots not truly cylindrical, or of uniform size from end to end, etc. The amount of freedom we should allow the pivot in its hole depends much on the quality of the watch and the perfection of its fitting, as a coarsely made movement would not bear pivots fitting so closely as a better one. The fitting also requires to be closer in the escapement than in the train; and closer in the duplex and chronometer than in the detached lever and cylinder escapements. It is not meant by this that it is not material that these last escapements should be closely fitted, but only that they will bear more looseness and still run passably, than the first named would. As it is intended to give directions and tools for measuring jewel holes and pivots, in the article on Jeweling, to follow, further details as to the exact amount of "play," or difference between the sizes of the pivot and its hole, in each case, will be reserved for that article. If a staff (or other piece) when put in its bottom hole, and the upper pivot left free, has scarcely any perceptible movement on inclining its bridge, or feeling of the upper pivot with the tweezers, it may be considered very closely fitted. If the upper pivot can be moved around a little, say 10° from the perpendicular, it is free enough for any well made escapement, but for coarse ones, or for the train holes, more is allowable. This is only a rough illustration, to give the idea, and serve till the article on Jeweling is reached.

(658) When pivots are fitted too closely, they are very apt to make trouble, and it is often difficult to detect the cause. If the parts are not strong and firmly put together the springing caused by carrying may produce a slight binding of the pivot in the holes, and stop the watch. The jewel holes are made as thin as is consistent with safety and the laws governing friction, and rounded out a little towards each end instead of being cylindrical from end to end. Even then too close fitting is unsafe. A watch was once brought in which had no apparent fault when examined, being well proportioned and made and finely fitted. But this very closeness of the fitting made it stop when carried. The pivots expanded from the heat of the person and became tight in their jewel holes. Suspecting this to be the cause, it was tested by putting it the adjusting oven, when it stopped running at once. After polishing the escapement pivots down a little smaller, there was no more trouble. Even when a jewel hole is large enough, it will often bind on the pivot from the common habit of twisting a bridge to one side to alter a depthing or free a wheel—

sometimes causing stoppage immediately, at others only making a troublesome case of the above described mysterious stoppage.

(659) All wheels should be examined as to being true in the flat and in the round, also tight on their pinions. Turn the wheel in the fingers, and examine every tooth to see that none are bent, that they are of good shape, and that their shapes are uniform, else some teeth will gear differently in the pinion from others. Also see that there are no particles of glass, or other substances hard to see, between the teeth or in the pinions. The main and center wheels are most likely to have teeth bent more or less; the main wheel, to have the front corners worn, which shows too shallow depthing. When the latter is the case, the depthing should be made deeper, and the tooth re-shaped. The best way to do the latter is in the rounding up tool, using a cutter with one safe side, *i. e.*, one side which does not cut, but holds the cutting side of the cutter against the worn side of the tooth, which should only be taken off enough to straighten it up and remove the notch in the corner. If both sides of the cutter acted, it would make the teeth too thin, and even spoil them. When the teeth are very badly worn, so that working out the notch would weaken the teeth, a good way is to knock the wheel off the pinion and replace it the other side up, which will give a sound surface of the teeth for wear. If necessary the new top surface must be polished or frosted and gilt, to make its appearance uniform with the other wheels.

(660) To straighten teeth that are bent, make a steel blade, say 1½ inches long, $\frac{1}{32}$ wide at the point, increasing to ⅛ at the upper end. The thickness should be, at the point, such as will go in between the finest teeth, increasing with a regular taper to $\frac{1}{16}$ at the handle. To use, insert the blade between the bent tooth and the next sound one, run it in till it fits snugly between them, then a very slight twist will straighten up the injured tooth. The support of the blade is at the base of the sound tooth, its strongest place, while its pressure is exerted upon or near the point of the bent tooth,—producing the greatest effect in the safest manner. If the teeth are very thick or stubbed, as in the main wheel, add a little pressure of the hand against the tooth to be raised, besides the twisting action. This will prevent marring the base of the supporting tooth by the force required. The tooth-straightener is a very handy tool, and should be on every bench. If teeth are broken out, either fit in a new wheel, or insert new teeth. Directions for doing this, and cutting them in the cutting engine, or spacing off the teeth for cutting by hand, shaping up the teeth, etc., will be given in the article on wheel and pinion depthings. Also for remedying a wheel too large or too small, etc.

(661) *Escape Wheel.*—For examining the escape wheel of the detached lever, the same directions apply as to that of the lepine, as regards the pinion, short shoulder to the lower pivot, corners of the pinion leaves spread, or touching the sides of the sink; the wheel, teeth touching up under its bridge, on the sides or bottom of its sink, on the top of the fourth wheel, and at the center of the same, etc. In addition, see that the wheel does not touch up under the outer end of the lever fork. If it does, and the wheel is horizontal, with the end shakes correct, (651), the under side of the fork must be filed or stoned off to clear. To save repetition, it will be understood that each wheel is to be examined as to being level, and true in the flat and in the round, the teeth sound and of correct shape, the pinions sound and upright, the pivots good, (650), the end shake and freedom of pivots in their holes correct, and other points already noted, as common to all wheels and all pinions, attended to. The examination of the escape wheel as regards its relations to the escapement was fully given in sections (314) to (437), on the detached lever escapement.

(662) *Fourth Wheel.*—See that it does not rub on the side or bottom of its sink, nor on the lower jewels of the escape or the third wheel, or on the settings around them, as they sometimes stick up considerably higher than the jewels. If so, they should be carefully burnished down. Sometimes screws are set so near the sink that they burst through the side and project inward,—either they or the brass touching the wheel. See that the fourth wheel, when at its highest end-shake, will not rub up under the escape wheel, either in the pinion or at the rim of the latter wheel, nor under its own bridge. When the fourth is above the escape wheel, see that it is clear on every side, and above and below. The depthing of the fourth wheel in the escape pinion should be examined with the utmost care, as this is the most particular bearing in the watch. In addition to the test in sections (633, 635) a more full and technical explanation of this subject will be given hereafter, which should be referred to in connection with the depthing of each wheel and pinion as we come to it. See that the fourth pinion is of proper size for the third wheel, and its leaves of correct shape, well polished and free from rust or "cut," and that they run truly or concentric with the pivots, the pivot holes or jewels not worn, nor the jewels broken, etc.

(663) *Third Wheel.*—See that the teeth do not touch the sides or bottom of its sink, the top of fourth wheel, nor the third or center wheel bridges above it. If the latter, file off the under corners of the bridges, where they rub, enough to clear in any part of the end-shake. Sometimes the metal of the bottom of the sink is sprung up around the center, and rubs there on the wheel, although clear around the edges. This should either be sprung down, or turned off in the lathe. The above refers to the thin metal of the plate, over the lower bridge or false plate screwed on, under the dial. See that the third wheel does not rub up under the main wheel teeth, or touch the barrel, or get into interference with the center pinion, or touch the the escape wheel or balance. Examine the pinion; if pivots, pinion leaves, etc., are smooth and polished, if pivot holes or jewels worn, pivots straight, round and cylindrical to the shoulder. See that the end-shake is no greater than is necessary, (651,) and that the third wheel bridge is firm in its place and cannot yield under the pressure of the center wheel. This is a common fault. The steady pins are loose in their holes, and only the screw keeps the bridge in place, (628). When the watch is fully wound, the bridge gives way and moves under the pressure, making the depthing of center wheel in the third pinion too deep, besides throwing the pinion out of upright, etc.

(664) *Center Wheel.*—The center wheel is very apt to have teeth bent, and the front corners worn down, and both faults should be carefully looked for. If it rubs up under its own bridge, on either side, when at its highest end shake, first see that the end shake is correct, the pinion upright, and the wheel true in the flat, then file the bridge or turn it in the lathe, to clear the wheel. If it rubs up under the main wheel bridge or the cover of the ratchet wheel, or against the side of either, they should be turned or filed to clear. If it rubs on the top of main wheel, that should be lowered. If that cannot well be done, thin the center wheel from the under side, or raise it if possible and drive up the lower hole in the plate, to hold it up. If the holes are jeweled, this cannot be done, but a thin washer may be made to fit on the lower pivot and keep it up. But this should not be so thick that the pivot could not reach through its hole. Very often the center wheel is bent or out of true, and only the lowest part rubs on the main wheel, (shown by curved marks in groups). Straightening up the wheel will remedy this. If the wheel is true but the pinion is not upright, the wheel will rub on one side or the other of the main wheel, and the marks will be seen all around it, but all made in the same direction. In this case the remedy is to upright the pinion, preferably by altering the upper hole, as changing the hole in the plate might derange the depthings of the motion wheels, etc. For further remarks about center pinion pivot holes, see under that head in "English Lever Train," to follow.

(665) Besides the depth of the center wheel in the third pinion, the action of the former must also be examined to see if it rubs up under the third wheel bridge, or even can get over the top of the third pinion and between it and its bridge. In the last case, lower the third wheel bridge till there is no more end-shake than is required for safety. If the center wheel still appears to rub, when at its highest position, and its end-shake is correct and should not be lessened, file the under

side of the third wheel bridge rounding from the entering edge to the jewel, and smooth past the jewel and off the other edge, so that there will be no corner or ridge to catch on the teeth of the center wheel as it passes, but so it can move smoothly under. If the center wheel still rubs hard on the third wheel jewel, and is horizontal and true, lower it by bending its arms down unless that will make it touch on the main wheel or the balance. In that case, either lower them, or, if that cannot well be done, the third wheel and pinion must be raised bodily, till the bridge will free the center wheel, provided that will not make trouble in the fourth pinion, or elsewhere. If the pivot holes are jeweled, the lower third jewel should be raised by "bumping" the false plate holding it, being very careful not to put any pressure on the jewel, nor distort its setting, but raise the whole equally and keep the jewel horizontal. Another way is to raise the third bridge, and put a washer on the lower pivot of the third pinion, to hold it up, as described in section (664), for the center wheel. A better one is to fit in a thicker jewel to raise the pinion. Some workmen incline the upper pivot of the center wheel towards the third pinion, to make it work lower in the latter. But this throws it out of upright, besides altering the depthings of the center wheel and of the motion wheels, and also deranges the action of the hands, and should never be allowed. It would be preferable to have some rubbing, rather than to remedy that by causing all the evils just spoken of.

(666) See if the center pinion or its leaves rub on the sides or bottom of its sink. If so, the sink must of course be turned out a little, in the lathe or with the freeing tools. If the pinion journals or pivots are very thin or much worn, they are liable to crack or be bruised or spread by driving the cannon pinion down close, and thus crack out a piece of the hollow pivot, or head it down in the hole and make it appear to have no end-shake, or make the pivot too large for the hole and so tight as to almost prevent the pinion from turning, etc. Thin pivots must be very tenderly treated. The pivots may be too long and stick through their holes a good ways; or too short, and allow the center washer to rub on the bridge, or the cannon pinion to rub on the plate. In the first case they can be shortened; in the second, the upper shoulder should be turned back to let the pivot stick through further, or, if that cannot be done, the center post should not be driven in far enough to hold the center washer tight between it and the end of the pivot, but leave it a little loose and free to turn on the staff, when no harm will be done even if it does touch the bridge; in the last, the cannon pinion can be turned off except right at the center, where a small projection, the size of the pivot, can be left around the staff. This projection would rest against the pivot, entering the pivot hole with it), and so hold the staff to its place. But little force would be required for effecting this, if the taper of the staff and of the hole in the center pinion was little or nothing, as it should be. If there is much taper, it should be reduced. Instead of turning off the cannon pinion as above noted, a very fine washer may be fitted on the staff to go between the two pinions. This washer must be of the same diameter as the center pinion pivot.

(667) The center staff should be tight enough to be sure to carry the hands, but not tighter than that, else there is danger of bending teeth in setting the hands, or tearing the center pinion loose in the wheel, or twisting off the square. The cannon pinion, likewise, should be fast on the staff, or the hands may stand still while the watch goes, the same as if the staff was loose in the center pinion. See sections (197, 198). The center washer should not touch the sides of the dirt cup. Or, if the dirt cup itself is carried by the staff, the same directions apply as for the center washer. It should be made to stand level, and not touch the bridge, nor in the hole in the cap or dome of the case. If necessary, to level it, the end of the center pinion pivot must be turned off true and level, when it will hold the dirt cup or center washer level. Sometimes the end of the center staff, from the top of the cannon pinion to its point, tapers too much, and the hand will not stay on, but soon gets loose and works off. Or it may be larger at the point. In this case the hole in the hand is stretched by going over the point, and of course it is loose when clear down against the cannon pinion. The end should be filed cylindrical, or tapering but slightly, to the point, and the hand will be tight at any place on it.

Legal Regulations for the Standard of Gold and Silver Ware in the Different Countries of the World.

BY EDWIN W. STREETER.

UNDER the head of *Gold Tests* is included the following: "In the case of silver being contained *in* gold, the relative value of the silver and gold is decided by driving off the gold in the crucible. In deciding the standard of gold alone, however, it is melted at once in the crucible with a corresponding quantity of silver and lead, and the finally remaining bead of silver which contains the gold is afterwards treated with nitric acid." (*Millaner.*)

These, however, are only the most usual methods of deciding the intrinsic standard. Of several which are interesting in the same department of science, we would particularize only one, namely, that of Archimedes, whose exultant "Eureka" signified, not that he had simply found out the way to determine the standard of the crown of King Iliero, but especially that he had enriched the world with a fundamental hydrostatic law—a discovery in the strictest sense of the word.

How far the art of working in gold and silver had been cultivated among the ancients, and how well they understood mixing the precious metals with alloy, is best seen in Livy's *Roman History* (I., xxxii., c. 2.), where it is mentioned that the qæstors showed the silver paid by the Carthagenians as tribute to be *impure*, and on application of the fire test it was found to be deficient in value by ¼.

Even in the time of the prophet Malachi we read (c. iii. v. 2, 3,) "For he is like a refiner's fire . . . He shall sit as a refiner and purifier of silver, and he shall purify . . . and purge them as gold and silver."

Nowhere do we meet with any intimation that the State undertook the supervision of the manufacture of precious metal wares, either for the purpose of drawing a financial profit from such a supervision or in order to protect the purchasing public.

The fact that the necessity for State control of this kind was nowhere manifested has the greater claim to attention, because at that time chemical and physical knowledge was by no means as widely spread as now, and because there were fewer people from whom information could be derived as to the value of objects in gold and silver.

Summing up the question of standards in the Roman law, Mr. Charles Roscher, in his work upon the *Legal Regulations of the Manufactures of Gold and Silver*, calls attention to the following: "Whoever bought brass for gold, or lead or any other silvery-looking body for silver; whoever bought a table plated with silver for massive silver, might, according to the Pandects, regard the purchase as void, because he had not received that for which he stipulated. Whoever, on the contrary, bought alloyed gold, which he erroneously considered to be of higher standard than it was, was compelled, if he bought the object merely as '*gold*,' without any condition of a definite standard, to consider the bargain valid against himself."

This principle applied even to the case of a person purchasing at a high price an old bracelet, which in all its parts was valued as gold, whereas the greater part of it subsequently proved to be *copper*, and only a little gold mixed with it. "For," says Uldian, "it did truly contain gold."

"This is in strict accordance," writes Puebla, "with the principle that the character of a bargain does not depend upon the just proportion of the price paid. On the contrary, the demand for such a just proportion would disturb commerce." A maxim which in Roman law was expressly intended to provide that no unfair opposition should be offered to trade.

The development of the Guilds, having for their apparent object the protection of the public, led at first to restrictions on the working of precious metals. The oldest regulation of the kind in England seems to have been issued in the year 1238.

Since, as will be seen later, the legal regulation of the standard of precious metal wares has, in all States, been subject to very frequent changes, and since it may safely be predicted that further changes will occur in most of them, we judged that it would be useful to add to this work a collection, as comprehensive as possible, of all the old stipulations and laws relating to the regulation of the standard of gold and silver ware. We applied, therefore, to every government, not only for information as to the various laws and regulations at present in force, but also for brief reports of the discussions which preceded the several legal changes effected by the various representative assemblies.

THE LAWS OF ALL COUNTRIES OF THE WORLD CONCERNING THE STANDARD OF GOLD AND SILVER WARES.—GREAT BRITAIN.

It is more than six centuries since the first decrees concerning the legal regulation of the standard of gold and silver wares were first made in England. These date from the year 1238, in the reign of Henry III., when, in consequence of fraud, it apparently was necessary to direct the gold and silversmiths that no one should manufacture gold of less value than 100 shillings per mark, or silver of a lower standard than that of the silver coinage.

The transfer to the London Goldsmiths' Company of the privilege (which holds good to the present day) of testing ware made of the precious metals, took place in the year 1300, in the reign of Edward I.

This act forbade the manufacture of any gold ware of lower standard than that of Paris; and by it the silver ware was required to be, at the lowest, of the standard of the silver coinage, and to be stamped with a leopard's head. Before any piece of work in the precious metals left the workshop, it had to be tested by the inspector specially appointed for the purpose. All wares in the precious metals which were not so rich as the legally fixed standard, were to be forfeited to the king, the offenders being *threatened* with punishment or fine at the king's pleasure.

These regulations at first only applied to London, but they were afterwards extended to the provinces.

In the year 1327, the first of Edward III.'s reign, the Goldsmiths' Company was charged to punish those who so cleverly overlaid tin with silver that their goods were taken for, and sold as, fine silver.

An ordinance of the Goldsmiths' Company in the year 1336, revoked the provisions of the law of the year 1300, and appointed that the manufacturer shall stamp his wares of precious metals. A law of 1363 confirmed the last part of this ordinance.

A law passed in the year 1379 (Richard II.) adds to the stamp of the manufacturer that of the town or district in which the work shall have been stamped, and also that of the king.

A law passed in 1392, in the same reign, conferred fresh authority on the Goldsmiths' Company.

In 1403 (Henry IV) it was enacted that no copper or brass work, except church ornaments, shall be gilt or silvered, and even these must be left unplated in one part, so that the metal of which they consisted might be recognized.

An ordinance of the year 1405 decided a dispute between the crafts of the goldsmiths and cutlers, settling that the latter had the right to work in gold and silver, but that their work must be tested by the craft of Goldsmiths.

In 1414 (Henry V.) silver work was forbidden to be gilt, if it did not come up at least to the standard of the coinage; while an enactment of 1420 forbade the silvering of any metal, excepting the spurs of a knight, the accoutrements of a baron or of one of a higher rank, or church ornaments.

In 1423 (Henry VI.) it was repeated that no precious metal wares should be offered for sale which did not bear the stamp of the guild and of the manufacturer.

In 1462 (Edward IV.) the right of the London Goldsmiths' Company was extended to the testing of precious metal wares in Chester, Newcastle, Norwich, Exeter, Birmingham and Sheffield.

A statute passed in 1477 (Edward IV,), reciting that the law made by Henry VI., was daily evaded, fixed the standard of gold ware at 18 karats; that of silver ware continuing, as before, uniform with that of the silver coinage. This law was reinforced in 1489 and 1552.

By a law passed in 1488 (Henry VII.), in which it is declared that the refiners of gold and silver do not observe the regulations affecting the standard of precious metal wares, and that they buy gilt silver from the Mint, the Exchange, and the goldsmiths, which they mix with alloy as they please, insomuch that no pure silver is to be obtained when required, to the great damage of the king's nobles and the Commons, the alloying of gold and silver and the sale of all alloyed metal were restricted to the officers of the Mint and Exchange.

In 1504 it was legally reaffirmed that the laws respecting the standard of precious metal wares were often evaded, and in 1573 (Elizabeth) it was enjoined that gold ware should thenceforth have a standard of at least 22 karats, and silver ware a standard of 11 ounces 2 dwts.

It is interesting to note how in this enactment as in several others, the good old times are looked upon in which better gold and silver were manufactured; and yet it is evident that, had this really been the case, the rulers would not have found it necessary to make such a series of laws with regard to these objects, each one treading upon the the heels of another, and all, in spite of their number, incompetent to deal satisfactorily with transgressions of the law.

In 1576 (Elizabeth) the determinations of the enactment of 1573 were legally fixed.

In the books of the London Goldsmiths' Company of the year 1597, a report is made upon the frauds and counterfeit stamps of two goldsmiths who were sentenced to be placed in the pillory at Westminster, with their ears nailed to it, and tickets over their heads, upon which their offences were written. From Westminster they were brought to the pillory at Cheapside, where each offender had an ear cut off, after which they were conducted through Foster Lane to the Fleet prison. In addition to all this disgrece they had to pay a fine of ten marks. This was the usual punishment in most countries for similar offences.

In Belgium, goldsmiths who manufactured precious metals of a lower standard than that required by law, were taken to the marketplace of their town, and there nailed by the ears to a pillory, being compelled to remain in that position till they had purchased their freedom by the surrender of a portion of their ears.

An order of the London Goldsmiths' Company, in the year 1695, reciting that the laws relating to the standard are often evaded, inculcates them anew.

A law of the year 1697 (William III.) promises to all who shall within a given time bring manufactured silver to one of the royal mints, a fixed price per ounce. This was occasioned by the alteration of the legal standard of silver ware.

In the same year the standard of silver ware was raised to 11 ounces 10 dwts., and the figure of the stamp to be used by the manufacturer and by the London Goldsmiths' Guild was settled.

In 1698 (William III.) the export of manufactured silver was forbidden. Mr. William Chaffers is of opinion that this measure was at that time a good and beneficial one, because it had the tendency to keep at home the metal of the coinage, to the welfare of the kingdom. This law, however, was in force only a very short time, as manufactured silver was again permitted to be exported under certain conditions.

The laws of 1700 (William III.), and of 1702 (Anne), order the establishment of Control Offices at York, Exeter, Chester, Norwich, and New-Castle-upon-Tyne, the testers of the London Goldsmiths, Guild, in consequence of the alteration of the legal standard of silver ware, being ever occupied, and the necessity of sending their goods to London to be stamped being attended with great inconvenience to the goldsmiths of these towns.

A law of the year 1719 (George I.), recording that silver ware manufactured according to the standard earlier in use was more durable than that manufactured after the new standard, decrees that no goldsmith is *compelled* to work at the standard of 11 ounces 10 dwts., but permits the use of this standard, and also of that of 11 ounces, 2 dwts. The same law imposes a duty of sixpence per ounce upon imported silver and silver manufactured abroad.

Metals and Alloys.

WET AND DRY COLORING.

IN speaking of 18 karat gold coloring mixtures, a writer in the *British Jeweler and Metalworker* says: "It appears that *dry* coloring is coming much into fashion, no doubt on account of the highly finished surface of articles prepared for the market by such a process. The very bright and rich looking appearance attained by this means, as compared with the *dead* surface of wet coloring, is one of the reasons why articles so finished are being sought after by the retail trade, with the idea of tempting the purchasing public with something to all appearance new and different looking to those generally offered to them for sale. Now, to produce this richness and evenness of surface to the greatest possible perfection, a special mixture should be employed for the work upon which it is to be produced, not only as regards the ingredients, but also which have to form the coloring paste, but also those of the alloy, of which the work is composed; therefore, it must not naturally be supposed that a good alloy which produces all the desired results in *wet coloring* will do so by manipulation under the regulations which govern this new process, and which is entirely different in its action and preparation to that commonly and formerly employed in the trade of a goldsmith. Yet this is what has been expected of an alloy more fit for bright gold purposes of finishing than *even* for wet coloring, by workmen whose every day experience should have taught them more wisdom. In wet coloring, to bring to the surface a presentable and uniform appearance involving a specialty of tint, an alloy is required capable of not only materially assisting the coloring mixture in effecting this, but it is also of the utmost importance that the chemicals employed for this purpose should be so selected and arranged in manipulation that the action of the one be perfectly suited to the other; and this must be so in every case if all the best results are to be achieved by the process of which we are speaking. Now, in dry coloring, it is even more imperatively necessary that these principles or regulations should have careful and proper attention paid them by the operator who is about to perform the process, unless he desires to see his work come from the color pot *patchy*, or with a white film upon the surface, which is much to be guarded against. Our idea of what a workman should be is this: he should not only be competent to perform the various duties of his trade *mechanically*, but also be enabled to explain the *rationale* of every process appertaining to his art. In order to afford some little assistance to our fellow workers by forwarding their advancement in the craft to which we have the honor to belong, we will endeavor to explain more closely the general details of the subject bearing upon the preceding observations.

Wet coloring is a process that considerably reduces in weight any articles submitted to its action; and this reduction, which takes place from the surface, is far more apparent in proportion to the poorness of the alloy, the amount of silver contained therein, and the strength of and length of time the coloring mixture is employed. By the strength we mean the quality of acid used in proportion to a given quality of alkaline salts. The greater the proportion of silver per ounce in this alloy to be operated upon in wet coloring, the greater should be the quality of acid, and *vice versa*. Why is this necessary? may be asked. We reply, because it is imperative that some strong mixture should be employed in order to break up the fragments of silver which underline the surface more or less of all colored gold work. Now, while silver is more resisting to the action of muriatic acid than copper, it very rapidly, when used in conjunction with a little common salt or sal-ammoniac, effects the desired purpose of breaking up and removing from the surface of the work all traces of that and other extraneous matter, leaving what, to all appearances, constitute a pure gold line surface, whereas, in the process of dry coloring very little, if any, is removed from off the articles, the mixture employed not having the power, chemically, to do so; it proves that if a fine deep orange color be desired upon the work, very little silver should enter into the alloy employed, for it only removes that depth of shade from the articles, which is so essential, should be maintained in every stage of manufacture, and which every one fails to produce in the finish when guided by wrong considerations.

The pale color sometimes seen on articles of first-class jewelry which has been finished by the process of coloring commonly called *dry coloring*, is not the result of any inferiority of the quality of the material of which they are composed, but due to the chemically resisting properties imparted to it by the incorporation of various proportionate parts of metals generally employed in rendering complete the formation of the mixture, in order that it may possess in a remarkable degree all those qualities of flexibility and ready compliance —qualities which are all in all to the jeweler, in a more or less marked manner, in every branch of his art. From a mechanical standpoint, all these qualities are specially desired by the art worker in gold and the precious metals. Now, the preparation of an alloy not only adds to and detracts from these qualities in accordance with the order of its composition, but it has, likewise, a very great deal to do with the numerous shades of color that are collectively produced by the trade; and any special mode of mixing by a firm consequently brings its own *specialité* of color: thus, under the operations of a skilful and practiced hand, we may have nearly every shade of color artistically worked out by a careful manipulation in gold, and *gold and its alloys*.

The pale color of gold work—which is not so rich looking and pleasing to the taste in comparison with a deeper tint—is often produced in ignorance of the scientific principles which naturally point to the cause of its production. We have frequently been informed of the utter inability of even practical persons to prevent this paleness upon their work, and we have before us abundance of proofs in support of this very testimony, in the shape of correspondence bearing upon the particular point at issue, the writers of which we have been able to assist by suyplying them with particulars regarding the cause of failure.

In one case submitted we have an alloy of full 18 karat value, containing as much as 15 per cent. of silver per ounce. Now, considering that the mixture for dry-coloring has only a very weak affinity, a chemical attraction, for the metals in its special mode of employment—such mode forming the process—it will be at once apparent, even to the most unobservant, that so large a percentage of silver must carry its tint, to a considerable extent, to and from the color-pot in which the experiment has taken place. When it is known that the silver in this alloy predominated something like 5 per cent. over the copper, there can be no surprise expressed at the work finishing pale by those well informed on the subject.

The principal cause of pale gold, as produced by the dry coloring process, having now been explained, it will be necessary to call attention to some of the subsequent devices employed in attempted improvements of this paleness, so as to bring to the surface a deeper and richer color to the work.

Of late years wet colored work, and burnished so as to produce a smooth, mirror-looking surface, has been pushed into the market as goods bearing the dry colored surface upon them. Not at all has the device been invented with the view of deceiving the public in the quality of their goods, but because operatives have been unable to produce by the older method that tone or depth of color required to satisfy public taste—a taste now vastly improved as regards former requirements—in the direction of a more artistic manner of finishing, as well as a much richer and deeper shade of coloring.

It should now be a well known fact that genuine dry coloring cannot be effected with all the elements of success upon work inferior to 18 karat gold quality; whereas, with wet coloring and subsequently burnishing, a similar color may be made to appear upon all qualities amenable to the wet-coloring mixtures of the period. The only effective check upon this kind of finishing jewelry work which we are at the present acquainted is its liability to detract, in a permanent sense, from the richness primarily imparted to it, by its diminished lustre.

Iron ladles were formerly used as utensils for holding the coloring mixture, and being very convenient to manipulate with—the handle serving to facilitate the process of access to and removal from the fire in which the operation is conducted—they became at the time very general in all dry-coloring processes.

The iron of which they are composed, it was assumed, greatly assisted the mixture in the giving of a deeper and richer shade of color to the work. This theory, no doubt, was true to some extent, and answered the purpose satisfactorily, anterior to the date in which modern art had been made to display the power—wonderfully combined in the action of certain metals, particularly suited to the objects sought for.

Ladles appeared to answer nearly all the requirements the goldsmiths desired readily enough, the only practical drawback—and this was a real one—being found to exist when manipulating with a large batch of work; the ladle being considerably shallower towards the sides, it presented the difficulty of a portion of the work farthest from the center exposing itself above the coloring mixture; therefore, it either necessitated smaller batches of work and the process more frequently applied, or the devising of some more suitable vessel to hold the mixture, the shape of which would conform to a degree to the batch of work when large in quantity. The latter method was adopted. This improvement took practical form in the present shaped color pot, although it was first made in iron, operators then preferring iron as the best material to employ.

In coloring with the iron ladle or iron pot, a very much duller and deader color was produced upon the work than that of the present period. It was usual to well rinse the work after coloring, and then the only other subsequent process was that of drying, which finally completely the work. There was no scratching or burnishing in use at that period of the goldsmith's art.

The color much resembles that to be seen upon Etruscan jewelry, and was effected by the use of various mixtures—of course it must be understood that it was all 18 karat gold that was so treated—all of which varied with different masters, as now, both in the proportion of ingredients and methods of application.

The following was a very good mixture in use at the time of which we speak, and produced the Etruscan color so much desired by workers in that art with very little difficulty. The ingredients generally employed consisted of saltpetre, 8 parts; common salt, 8 parts; copperas (sulphate of iron), 1 part; alum, 1 part; white vitriol (sulphate of zinc), 1 part; all these were pulverized to a fine powder, and intimately well mixed together with the hands, and then transferred to the iron ladle for fusion, or otherwise, for the dissolution of them in their water of crystallization. The work, having been well prepared to take the color, was dipped into the rising mixture and turned about two or three times, and then withdrawn and rinsed in hot water, or water containing a small portion of one of the corrosive acids, which dissolved any color that adhered to the work. The drying of the work in hot box-wood sawdust finished all manufacturing processes, and the work should then, if perfect, be free from all spots or blemishes and of a uniform rich dull color.

Theory of Vision.

THE majority of physiologists of the present day share the opinion of Helmholtz, who explains the possibility of seeing at different distances by changes of form in the crystalline lens, the latter becoming more convex when near objects are looked at, and on the contrary, flattening when those at a distance are regarded. M. Fano, in the current number of *Les Mondes*, opposes some grave objections to this theory; among these, the following:

1. It is possible for certain persons who have been operated upon for cataract by extraction, to see near and far with the same spectacles, that is, with glasses of short focus.

2. The crystalline lens is too dense to allow of its readily taking such modifications of form.

3. The weakness of the muscular organ (ciliary muscle), which is regarded as the agent designed for producing such modifications in the lens.

4. The excessive fatigue to the eye which would result from these incessant contractions of a very weak muscular appaaatus, should the lens really change form, from morning till evening, during the exercise of vision on near and distant objects.

"Is it absolutely necessary," he asks, "that changes of form in the refracting apparatus of the eye should take place in order to see near and distant objects clearly? If the eye were a simple optical instrument, it would be necessary to answer this question in the affirmative. But the eye differs from an ordinary optical instrument in this, that the screen of the camera obscura (which the organ represents as a whole) is not an inert membrane, but on the contrary, an organized living one—the retina. Now, the existence of such a screen as this must modify, not the mode of formation upon it of the image of exterior objects, according to the distance at which such objects are placed in relation to the eye, but rather the conditions of impression and sensation of these images.

"In effect it is not indispensable in order to see objects that their image should be sharply defined on the retina; that is, that all the luminous rays coming from the same point of the object should unite at a common focus in the retinal layer of rods and cones. Vision still takes place, the eye sees, even when this focus is formed behind or in front of the rod and cone layer of the retina; that is to say when circles of diffusion are formed on this layer. A very simple experiment will serve to demonstrate this fact: Place a printed page for reading at a distance of 12 inches from the eye; now, gradually bring it nearer the eye of the subject, and the latter will still be able to read up to a certain distance, although the printed characters are surrounded by a halo, thus indicating that the image of these characters is forming on the retina a circle of diffusion, and not a sharp image.

"So, in order to see it, it is not necessary that the image of exterior objects should have its focus on the retinal layer of rods. But in this case the impression is less active, because all the luminous rays from the same point of the object unite in less numbers upon the same cone of the retina. If then the impression is less active, the sensasion is also less powerful, and vision is less clear.

A NEW calendar watch has been invented and patented by Minor H. Paddock, East Clarkson, N. Y. He claims the combination of calendar-indexes and arbor setting devices, with the winding mechanism of a time piece constructed to revolve the arbor in one direction only. The combination of an arbor setting device, with a winding-post having a ratchet, retained by spring-forced click, or equivalent. The combination of a wheel, a bar and winding mechanism. A lever having shoulder in combination with spring, acting as a detent, and having arm in combination with wheel, acting as a release or their equivalents. The combination of arbor-setting devices or their equivalents, with the calendar lever. The lever, having arm, pawls and shoulder, and arms or their equivalents. In the arbor setting devices of a combined calendar and time-pieee, a wheel or equivalent, having its circumference divided proportionally in number to the end of the device, or equivalent, and arranged in its daily revolution to bring once in twenty-four hours the point into co-operation with calendar devices for setting of the calendar. The combination of wheel, lever and detent. The combination of arbor-setting devices and the daily-acting calendar-lever with skipping device or equivalent. The lever, or its equivalent, in combination with skip-regulator and having working face in combination with, or equivalent. The wheel having cogs on its circumference, whereby, by action of, or equivalent, to revolve once a year, having its circumference arranged to act as a limit to the daily movement of lever, or equivalent, for setting the calendar, and provided with slots for increasing the scope of said lever in affecting skips at the end of short months. The wheel, or its equivalent, having slot and shoulder. The lever, in combination with spring and shoulder of wheel. The combination of lever with calendar index wheels, and lever and wheel, or its equivalent. The combination of lever, index-wheels, lever and wheel with the arbor-setting devices, the spring and detent and the winding-stem. The lever, having arm in combination with, having tooth, or equivalent.

Precious Stones and Gems.

BY EDWIN W. STREETER.

BORT AND CARBONADO.

CERTAIN diamonds are found of inferior quality, and so imperfectly crystallized, that they are useless as ornamental stones. These are called "bort," and are crushed to form diamond-dust, or are used for engraving. The diamond-powder formed by the crushing of these inferior stones, and the diamond-powder produced as the result of the cutting and cleaving of rough stones, possessing, of course, the property of intense hardness, are, after mixture with oil, employed for polishing diamonds.

Carbonado, or, as Major Beaumont, M.P., calls it, "Carbonate, or Carbon," resembles in color and appearance, fragments of hematite. Both these names, carbonado and carbonate, are clearly misnomers, as, chemically, the body referred to is like diamond, graphite and charcoal, a form of the element carbon. It was at first introduced for the purpose of cutting diamonds, after the same fashion as the "bort," referred to above. Of late years, however, a new and most important application of this material has been made. It is employed for the purpose of drilling holes in rocks, and with most remarkable success, so that the value of "carbonado" has risen very greatly.

The stones are fixed in an annular ring of steel, and by means of a superincumbent weight of from 400 to 800 pounds, are pressed downwards into the rock, while at the same time the crown into which they are set is made to revolve 250 times a minute. Over the cutting faces water is constantly passed to keep the diamonds cool, and to wash away all the debris that is formed.

The diamond-drill works not by a blow but by rotation. Its action is an abrading one, not percussive or cutting. So adamantine is this "carbonado," that a mile of sandstone or of granite can be bored through by the diamond-boring apparatus before the stones are seriously worn. The loss from friction is quite trifling. Sometimes, indeed, the "carbonade" may be so set in the "head" as to present an angle of the "carbonado," at which cleavage is practicable. Then of course, the use of this particular part is destroyed. The other loss which may be sustained, which far exceeds the former, results from some of the stones being violently torn out from the bore-head.

Before concluding our notices of the advantages of "carbonado" in rock boring (as adopted by the Diamond Rock-Boring Company), we must refer to the drawback in this admirable apparatus, viz., that it is practically useless when the workmen come upon a soft stratum, but the advantages generally far exceed the drawbacks.

(1.) The most important, from a practical point of view, is the evenness of the solid core produced by the boring machinery, which core gives full information as to the nature of the strata passed through.

(2.) The apparatus works as well in water as in dry solid rock.

(3.) It accomplishes in months what could only be effected by other known means in years.

(4.) Finally, it is undoubtedly, more than any other method of rock-boring, economical of money as well as of time.

The subject of diamonds must not be concluded without some notice of a new chemical discovery which possibly may exercise a great influence upon the commerce of diamonds. The discovery treats of nothing less than a formation of bodies akin to the natural carbon-diamond, but consisting of the element boron.

It is well known how Wohler and Deville, while trying to produce, in large quantities, pure aluminium, discovered a method of crystallizing silicon and boron. The crystallized boron showed in so remarkable a manner the properties of the diamond—its hardness, transparency and fire—that there must be an intimate relation between the two. This element, boron, in combination with oxygen, forms boracic acid, as carbon with oxygen forms carbonic acid.

There is a surprising similarity between the elements boron and carbon. They both exist in three conditions: 1st, amorphous—as charcoal; 2d, graphitoid—as graphite; 3d, crystalline, as diamond. They agree, also, as far as known, in the modes of origin of these three forms. To form artificial graphite an excess of charcoal is heated in contact with iron; as the whole cools, such charcoal as does not combine with the iron to form steel, crystallizes out as graphite.

The crystalline form of the carbon graphite coincides with that of the boron-graphite; but, as to color, the boron-graphite is red, and the carbon-graphite pure black or blackish gray.

The natural carbon-diamond crystallizes in the regular form and in octahedra. The crystalline form of boron is tetragonal—an elongated prism whose corners are somewhat blunted, or else foliated crystals. The foliated crystals are harder than the elongated prism, and are almost always black. The large crystals are mostly transparent and sometimes colorless; and not unfrequently they are tinged with garnet-red, hyacinth-red or honey-yellow.

Possessors and purchasers of diamonds need not be alarmed at the prospect thus dimly shadowed forth. It has only been possible to produce boron-crystals of small size, and therefore of no value as ornamental stones. The boron-diamond will never replace—never in any way approach in value—the true carbon-stone. It is, however, a matter of great interest to scientific men generally.

CELEBRATED DIAMONDS.

There are a few well-known and costly diamonds which have received world-wide attention, and attracted, ever since their discovery, hundreds of years ago, peculiar interest. Of these gems each has, so to say, its own special history; in many instances signalized by deeds of violence and crime. I purpose calling attention to a few of the most important.

(1) The largest diamond is known by the name of "Braganza," and was discovered in the year 1741 in Brazil. It is now among the Portugese state jewels. It weighed, in its rough state, 1,680 carats, was the size of a hen's egg, and was valued at £58,350,000. But as it has never been cut, its genuineness is naturally doubted, and it is believed to be a white topaz.

It is believed that the Portugese Government suppressed information regarding it, out of a supreme care for their finances.

(2) The largest known diamond, at present, is that of the Rajah of Mattan, in Borneo. It was found on the island about 120 years ago, and weighs 367 carats; it is a pear-shaped stone, with a small hole or crevice at its short end. Notwithstanding many battles have been fought for it, it still remains in the possession of the Rajah's family. It is said that the Governor of Batavia offered $150,000 and two men-of-war, with guns and ammunition, for it, but the Rajah refused to part with it on any terms, saying that he regarded it as a "talisman, upon the possession of which both his own and his family's happiness depended."

(3) The diamond known as the "Great Mogul" has received an amount of attention beyond any other. Under the name of the "Koh-i-noor" (Mountain of Light), it played an important part in the Exhibition of 1851. The history of this stone dates back to 56, B. C., but there is nothing known with certainty about it until the beginning of the fourteenth century, when it was held by the Rajah of Malwa. Later it fell into the hands of the Sultans of Delhi after their conquest of Malwa.

Tavernier gives a description of it as one of those he saw among the jewels of Aurengzebe, affirming that it exceeded all the others in size and worth. He speaks of it as a rose in form, like the half of an egg; of 186 carats weight; but in its rough state it weighed 793⅝ carats. The Shah Jahan sent the rough stone to a Venetian lapidary, named Hortensio Borgio, but was so angry with the manner in which this artist dealt with it, that he not only refused the payment for cutting it, but fined the unfortunate Borgio 1,000 rupees, all, in fact, that the man possessed.

There hangs some doubt about this gem, as Tavernier seems to have given two varying accounts of it. This has led to the belief that the Great Mogul and the Koh-i-noor are not one and the same stone, but two separate ones; there can, however, be no doubt as to their being identical. It is not likely that there would be two stones in the same collection, with the same characteristics, and varying in size only half a carat.

It remained in the treasury of the Mogul dynasty in Delhi until the wild outbreak of the Tartars, when they passed over the Affghan mountains, and poured in upon the north-west of India. Then the Mahommed Schah, great-grandson of Aurengzebe, became possessor of the jewel. He valued it so much that he wore it hidden away in his turban. When the conqueror Nadir Schah came to take possession of Delhi, Mahommed had to give up everything of value to him in the treasury, but he kept this stone back. It was one of the women of his harem, however, who betrayed him to Nadir Schah.

A grand festival was held in Delhi, at which the two rulers swore love and friendship, and to Mahommed's astonishment, the Nadir, at the close of the feast, declared he must exchange turbans to cement the love and friendship they had just sworn to each other.

Mahommed had no time to consider, and indeed the Nadir gave him no time, for he snatched off his own and subsequently the turban of his friend.

The self-command of Eastern rulers is proverbial. Mahommed showed neither by word nor sign his sense of his loss, or his astonishment, and Nadir began to think he might have been deceived by the woman as to the hiding-place of the diamond.

As soon as he was alone he untwisted the turban, and within its folds found a packet, which he opened. There lay the diamond which he was the first to greet with the name Koh-i-noor or Mountain of Light.

So the Persian Nadir carried it with him to Corassan, gifting it with every kind of fabulous property. It passed at his death into the hands of his son who, having none of the strength of his father, possessed it but a short time. From him it went to Ahmed Shah, the founder of Cabul or Abdal dynasty; thence to his descendant, Shah Shuja, whose wild romantic life made him a fit possessor of this stone of many fables. When driven from Cabul the diamond was his companion, and in his subsequent imprisonment his only companion. Although deprived of his eyes, and unable to gladden his sense of sight by its brilliancy, he still contrived that it should accompany him in his exile to Peshawur, to Cashmere, and to Lahore. He was nominally the guest, but really the prisoner of Runjet Sing. Runjet Sing was no judge of diamonds, but he set a high value upon the possession of this particular stone, and tried every means in his power whether by menance, entreaty or cunning to obtain it. He sent for the wife of the unfortunate king of Cabul, demanding it of her, but she assured him she had it not. He commanded all her possessions to be brought to him, by which means he obtained many valuable stones, more costly than any he had ever possessed before. He naturally thought the Koh-i-noor must be amongst them. Shawls, carpets, and a score of other things he retained, so that the poor Begum had in the end only very little restored to her. Ere long he discovered that *the* stone was not there, and he had the Begum watched closely. Nothing now would satisfy him but its possession. He tried by starving her and her family to obtain news of it, but failing in this he tried the effect of promises. She stipulated that the Koh-i-noor should be placed in his hands if he released her husband from his imprisonment in Cashmere, gave a guarantee that his life should be spared, and conceded other minor matters which she named. The result of this was that Runjet Sing released Shah Shuja at once, relying on the honor of the Begum to fulfill her part of the contract. She thereupon declared that she had not the diamond in her possession, but had pledged it to a merchant in Candahur. The Runjet resorted to his old experiment of starving her, but neither this nor any other plan was successful. At length Shah Shuja himself gave a promise to Runjet Sing, that on a certain day the Koh-i-noor should be his.

It was on the first of June, 1813, that Runjet Sing, together with some faithful friends and a few good judges of gems, went to Shadera, the residence of Shah Shuja. On arriving they were greeted and seated. An hour passed in dead silence, and at length the Runjet whispered one of his attendants that he should remind Shah Shuja why they were there. The Shah thus reminded, beckoned to a slave, who retired, and soon returned with a packet which he placed on the carpet, midway between Runjet Sing and Shah Shuja. Again a dead silence fell on all, till Runjet Sing, able to bear no longer delay, beckoned to one of his people to open the packet. It contained a gem, which, according to the judges there present, was the *genuine Koh-i-noor*. The silence was broken by Runjet Sing asking "At what price to you value it?" "Good fortune," answered the Shah, "and that is always the property of those who have vanquished their enemies." The manner and bearing of Shah Shuja were so dignified that they made a great impression upon the assembly, and no one left the house without paying tribute to the honor and dignity of the deposed prince. The diamond was set in a bracelet, and worn by Runjet Sing on every great occasion. On his death bed there was an attempt made to induce him to bequeath the stone to the idol Juggernaut. It remained, however, in the hands of his successors, who wore it occasionally.

After the murder of Shu Sing, it was deposited in the Lahore treasury until the boy Rajah Dhulip Sing, acknowledged by the English Government, was stationed at Lahore with an English Regent.

After the annexation of Punjaub by the English Government, the crown jewels of Lahore, and among them the Kohinoor, were confiscated by the East India Company, a stipulation being made that the Koh-i-noor should be presented to the Queen. Lord Dalhousie sent two officers in charge of the gem to England, and it was delivered to the Queen on the 3d of June, 1850. Its weight on arriving there was $186\frac{1}{16}$ carats. It was of an irregular egg-like shape, and so unskilfully cut that it did not look better than a crystal. It was exhibited in the 1851 Exhibition, and was valued at about £140,000. Prince Albert asked the opinion of Sir David Brewster as to the manner in which it could be most advantageously cut, and about the stone generally. He found in it, as in so many other large diamonds, several little caves, which he declared (according to his theory) to be the result of the expansive force of condensed gases. This, together with the flaws already noticed, he considered, would make the cutting of it, without serious diminution, a very difficult thing. Messrs. Coster, however, of Amsterdam, thought that in the hands of skilful workmen, the difficulties might be overcome. Several patterns of cuts were laid before the Queen, from which she selected the form it now has, that of a regular-cut brilliant.

Herr Voorsanger was the workman selected from Amsterdam to cut it. His labors were conducted in the Atelier of the Crown Jewels, in London. To assist his labors a small four horse power machine was erected, and the cutting commenced by the Duke of Wellington placing it on the cutting mill on the 6th of July, and it was completed at the end of thirty-eight days of twelve hours each.

In order to remove one of the flaws, the number of revolutions of the cutting wheel had to be increased to 3,000 a minute, and then the object was attained, but very slowly. This process decreased the weight of the Koh-i-noor from $186\frac{1}{16}$ to $106\frac{1}{16}$ carats. King, in his *Natural History of Precious Stones*, regrets it being cut at all, thinking it preferable that it should have remained as a specimen of a monster diamond.

How to test Diamonds.—Mr. F. W. Streeter, the well-known London jeweler, in a letter to the *Times*, says already a panic seems to have been created by the report of frauds in connection with imitation jewelry and diamonds known as the "Waterkloof." Mr. Streeter says it may allay some misapprehension if persons who have recently purchased diamonds of which they have any doubt would submit them to a very simple test, viz., the file. By drawing across the surface of any imitation diamond a small steel file, an effect is produced as highly detrimental to the spurious as it is satisfactory to the genuine article. To the uninitiated no better test presents itself

Cost of Diamond Digging.

DIAMOND digging is expensive. We will take, for example, the average digger, who owns a quarter of a claim, and works his own ground. He can take his choice, according to locality, of paying from $1,000 to $10,000 for his quarter claim—*i. e.*, 7½ feet by 31 feet. It pays best to buy high-priced ground. His outfit of digging tools, washing-machine, etc., will cost, say, 1,000. His gang of 20 Kafirs will cost him $5 each per week, or $100. One overseer besides himself, $25 per week. Meat and tobacco for Kafirs, $5 per week extra. Then expenses of carting and taxes will make this total outlay at least $200 per week, or over $10,000 a year, exclusive of his own expenses of living. If one cannot spend $800 per month, I believe it is of no use to go to Kimberly to dig for diamonds. To offset this expense is, of course, good luck in "finding," and from the very beginning of operations the digger often not only clears expenses, but makes a handsome profit. There is no doubt that diamond digging pays two-thirds of those engaged in it, well. The fortunes made, as a rule, are small and numerous. Rarely has any one cleared $50,000 from any one claim. Success seems to be very evenly distributed, and chiefly attainable by those who can begin with say from $3,000 to $5,000. The amount of money paid for Kafir labor alone is enormous. For instance, there are a thousand wheels; allowing five Kafirs to each, we have 5,000 laborers daily at the mine. These, at $5 each per week, are paid $25,000, or $100,000 per month, or $1,200,000 per year, and this for 5,000 Kafirs only. The assessment of the Kimberly mine for the year 1877, simply for the purpose of distribution of rates or taxes, was $5,151,500, or about $7,000,000, if we add a third to bring the first amount up to selling prices. It apparently never occurs to the digger to inquire into the unstable nature of the whole Kimberly fabric. Immense sums of money are invested in and around the mine, and owners of town lots, of houses, of public buildings, and of claims, have settled into the calmest feeling of security. But no fear disturbs the digger of Kimberly. His belief in the immortality of the mine is supreme. But there are influences at work which are crowding the small capitalist from the field. The increasing depth, crumbling reef, and inflowing water are fast multiplying the expenses of working. The great bugbear of the digger is the word "company," but even now small proprietorships are becoming merged in large aggregations of claims, and the next phase of mining operations must undoubtedly be that of several large and competing companies, or perhaps a single one controlling the whole mine. Then the individual romance of diamond-hunting will be over. But there is no danger that the diamond will ever become common. Nature has placed it in lands difficult of access, and it is likely to remain a royal gem, surrounded with the seclusion of royalty.—*Scribner's Monthly.*

Fire Gilding.

MR. HERMAN BUSH, in a letter to our able contemporary, the *British Jeweler and Metalworker*, gives the following method of fire gilding now almost superseded by the simple and less expensive method of electro-gilding. Nevertheless it is still preferred for certain purposes, and a description of an easy way to accomplish it with safety and the smallest possible expense will, no doubt, be of interest to our readers who are desirous or may have occasion to practise it.

The articles to be gilded are first of all well cleansed by dipping into a mixture of 8 ozs. oil of vitroil, 8 ozs. nitric acid, and 1 oz. of common salt, and immediately after rinsed in several clean waters, and dried in sawdust. It is well then to burnish all parts which are to appear bright, as they will be easily reburnished after gilding if properly smoothed before. If the whole article requires gilding it may be placed in a mixture of nitric acid and shaken about; if parts are to be gilded only, the mixture may be applied with a bit of cloth tied to a stick, until properly adhered to the parts intended to gild, and all superfluous liquid drained off. Next comes the gilding process. Gold rolled out to a thin sheet is cut into small pieces and melted, together with mercury, in a small crucible, the inside of which is previously rubbed over with whiting, and, after melting, poured into cold water. It forms a paste-like mixture, which is squeezed in a leather bag until nearly all the quicksilver is expelled, leaving only a little combined with the gold. This substance, which is called amalgam, is mixed with nitric acid, and applied with a brush or hare's foot, to be used for this special purpose, to the articles or parts thereof to be gilded, and exposed to a gentle heat. They are then removed, and the amalgam solution again applied and reheated; and, after repeating it a third time, they are exposed a somewhat longer time to the heat, when all the mercury will evaporate, and the gold will remain as a coating on the articles. They are then placed in lukewarm water, and the operator will do well to thoroughly wash and clean his hands, so as to remove every particle and trace of mercury, to avoid coming in contact with the already gilded articles. They are then gently scratchbrushed, rinsed, and dried in sawdust, and afterwards reburnished, if required.

Views of a Correspondent

DES MOINES, September 2, 1878.

MR. EDITOR:—If there is not some system devised by which the natural rights of retail dealers are better protected, the re-opened question as to the supremacy of foreign or American made watches will be helped to a solution, and the next few years will see a revolution in the sentiment of the trade, and a general resentment of the injustice of allowing the smallest of dealers, men who keep no stock, and in fact those who are not in trade at all, to regulate the price of goods for men who have both faith and money invested. It is a notorious fact that any man who sends out a card or announces himself to be in any kind of mercantile business, can and does get, for the purpose of abusing, the same price as a man who carries a retail stock of ten thousand dollars. With his little "price list" for a sling, this horological David opens fire on the show case of his more pretentious competitor, and invariably with the historic result.

Legitimate dealers are tired and disgusted with the present condition of affairs and are ready to examine the advantages offered by confident and enterprising importers.

In fact the time is near at hand when the average and substantial dealers throughout the country will look to systematic and *defined* action for relief.

Manufacturers tell us they cannot help it, and that they use as much discretion as possible in the matter.

We believe you, gentlemen, but the situation has been unfortunate for the regular trade, and when you find it as unfortunate for yourselves we think more equitable methods of managing your vast interests will be discovered.

Truly yours, HENRY PLUMB.

BEN LANDER, well known to the trade in this city, has surprised his friends by making a new departure in the artistic line, and has come out strong in crayon drawing. Indeed, if we may judge by the marked excellence already evinced by Mr. Lander, he will soon take rank with the professionals of this city, and his works will challenge competition on the walls of the Academy *salon*. His pictures are very finely finished and firm in outline, and are admirable portraits, inasmuch as they present a life-like appearance. This is in great measure due to the attention with which Mr. Lander has studied the human eye in all its phases, and his mastery in the delineation of this organ enables him to give vitality to his pictures. He has already perpetuated the features of several of his friends, and we understand that commissions are pouring in so fast that Mr. Lander contemplates abandoning the store for the studio. He would not be the first of the guild who has changed business for the study of art.

Workshop Notes.

GALVANIZING.—Small articles are galvanized by being dipped in muriatic acid and dried in a reverberating furnace, next thrown into zinc covered with sal ammoniac, left for a minute, and taken out slowly with a skimmer. To separate them, they are placed in a crucible surrounded with charcoal powder, then heated to redness, and shaken about till cold.

SILVERING.—The *Deutsche Indust. Zeitg.* gives a method for this purpose, invented by Boettger. The objects to be silvered, after being thoroughly cleaned, are suspended for about ten minutes in a bath made as follows: A fine powder of tartrate of silver is kept in suspension in distilled water, and ammonia is added until almost all of the tartrate is dissolved, and the liquid shows no odor of ammonia.

MCLANE'S ANTI-OXIDIZER is the only reliable preparation in use among jewelers that will preserve the color of jewelry while in process of hard soldering (passing through the fire). The most delicate engraving or chasing is perfectly preserved when treated with this solution, and the article on which it is used may be heated to a red heat without fear of discoloration. This solution may be had of the material dealers.

THE composition of the Russian tula, or niello silver, has been hitherto kept secret. According to the *Berliner Tagblatt*, the firm of F. Zacher & Co., in Berlin, have discovered the method of manufacture, and have made it in large quantities. It consists of nine parts silver, one part copper, one part lead, and one part bismuth, which are melted together and saturated with sulphur. This mixture produces the gorgeous blue which has often been erroneously spoken of as steel blue.

NEW FLAT REGULATING SPIRAL.—M. Phillips, in the *Revue Chronometrique*, writes as follows: During a visit to Locle (Switzerland) at the end of 1871, I advised, after certain theoretic considerations, several talented workmen employed in regulating chronometers to furnish the flat spiral with an interior terminal theoretic curve, in addition to the external terminal theoretic curve. Experience having since then confirmed these ideas, and the employment of these spirals becoming more and more extensive, it appears to me useful to publish this theory, which is founded on the general theory of the regulating spiral.

HOW MANY watchmakers, removed from the centres of manufacture, experience serious difficulty in replacing an elbowed, cylindrical, or spherical spiral, and find it impossible to regulate a watch with a certain precision. There is no doubt that, sooner or later, science will furnish the means to render certain metals sufficiently inoxidizable to answer the requirements of watchmakers. Perhaps there may be found among the metals recently discovered, or as yet little known, properties which may render them available to replace more efficiently those we know of up to the present.—*Journal Suisse d'Horlogerie.*

PICKLING AND DEADENING.—It very often happens that jewelers want to give certain objects an appearance of gilding. The following method will be found very useful; an appearance of brass will be given to the objects. These must be carefully cleaned from all fatty matters and dirt, or else the liquid will not act uniformly. Sulphuric or nitric acid is used, with or without tartar. The sulphuric acid is diluted with ten or twenty parts of water. The sulphuric acid has the quality of dissolving the borax of the solder, which would otherwise have to be removed by mechanical means. As it has the property also of extracting the zinc from brass, and giving the objects a darker and redder color, it is not suitable where dipping only is required. As a general rule, therefore, nitric acid is to be preferred with about ten parts of water. The tartar has no influence on the color, and it is difficult to use it, as it must be applied with thirty parts of water in a boiling state. The dipped articles are then rinsed in water and dried in shavings unless pickling is required. For this the same acids are used, with the difference that sulphuric acid alone cannot be employed. Either nitric acid without any addition of sulphuric acid is used, which gives a bright surface verging on green, or nitric acid to which sulphuric acid has been added, which produces a yellow gold color. The acid bath has generally additions of table salt or snuff. The salt is decomposed by the acids, muriatic acid is precipitated and forms aquafortis with a part of the nitric acid. There is this advantage here, that most kinds of brass contain some tin, which is transformed into oxide of tin by the nitric acid, and as it is indissoluble in it, it remains on the surface of the metal, while it dissolves in the acids of salt.—*Deutsche Uhrmacher Zeitung.*

IRON EXPANDING WHEN MAGNETIZED.—An interesting experiment in which Mr. Edison's new tasimeter was successfully used to detect the lengthening or shortening of a bar of iron when magnetized or demagnetized, is described by Profs. A. and T. Gray in *Nature*. Their apparatus was so arranged that the variations in the length of the rod would cause a varying pressure on a button of carbon, in an electric circuit. The result of numerous trials showed that the rod was lengthened by being magnetized, and assumed its previous size when the magnetizing force was removed. The experimenters hope soon to be able to measure the elongations under given amounts of magnetic intensity.

KOLLER'S *Neuesten Erfahrungen und Erfindungen* reproduces an old recipe for the production of various colors on brass, but which, as it may be new to many of our readers, we reproduce: Dissolve 60 grams bitartrate of potassa in a liter of water, to which add 30 grams tin salt (protochloride of tin) dissolved in a fifth of a liter, heat to boiling, and allow the resulting precipitate to settle. The clear liquid is now to be poured, under constant stirring, into a solution of 180 grams of hyposulphite of soda in ¼ liter of water, and again heated to boiling, during which operation a quantity of sulphur will be separated. The resulting clear solution is now ready for use, and gives to brass articles suspended in it, or when applied on the metallic surface, according to the length of the exposure or the amount of the application, a great variety of shades of color. First follows a light color, then all shades successively from red, dark blue, light blue, and finally brown. The sulphide of copper produces similar effects.

THE *Industrie Progressive* is responsible for the following statement: Metals may be rapidly colored by covering their surfaces with a thin layer of sulphuric acid. According to the thickness of the layer, and the duration of its action, there may be obtained tints of gold, copper, carmine, chestnut brown, clear aniline blue, and reddish white. These tints are brilliant, and if care be taken to scour the metallic objects before treating them with the acid, the coloring will suffer nothing from the polishing. On making a solution of 640 grains of lead acetate in 3,450 grains of water, and warming the mixture to 88° or 90°, it decomposes and gives a precipitate of sulphuret of lead in black flakes. If a metallic object be immersed in the bath, the precipitate is deposited upon it, and the color produced will depend on the thickness of the deposit. Care must be taken to warm the objects to be treated gradually, so that the color may be uniform. Iron treated in this way has the aspect of bluish steel; zinc, on the contrary, becomes brown. On using an equal quantity of sulphuric acid, instead of the lead acetate, and warming a little more than in the first case, common bronze may be colored of a magnificent red or green, which is very durable. Very beautiful imitations of marble may be obtained by covering the bronze objects, warmed up to 100°, with a solution of lead thickened with gum tragacanth and afterward submitting them to the action of the precipitate spoken of above.

Returning from Europe.

Mr. LeRoy W. Fairchild, the well known gold pen manufacturer, has returned from Europe.

Mr. Alex. M. Hays arrived in the Russia. His stay in Europe has been marked by liberal purchases of artistic goods suited to the requirements of his trade.

Mr. Louis Strasburger returned in the Britannic from a four months' sojourn in Europe. Mr S. brings with him many novelties in watches and a brilliant display of diamonds.

Mr. Louis Kahn, of L. & M. Kahn, has recently returned from abroad, where he has been supervising the manufacture of watches that will best meet the requirements of this market.

Mr. Henry Fera, importer of diamonds, arrived in the steamer Frisia. Among his selection of goods for the fall trade is a rough diamond which gives promise of extraordinary beauty.

Mr. Thos. Le Boutillier, of the firm of Le Boutillier & Co., arrived in the Scythia. During his stay abroad he has secured many novelties in clocks, bronzes, fancy goods, etc., fresh invoices of which are constantly arriving.

Mr. G. C. Taylor, of Taylor & Brother, arrived recently from Europe. Mr. Taylor has visited the principal marts of the old world in search of novelties in fancy goods, clocks, bronzes, faience, etc., etc., which now adorn the shelves and tables of their extensive show rooms.

Mr. Magnin, of the eminent house of Ve J. Magnin, Guedin & Co., has returned from his annual visit abroad, a result of which is the receipt of invoices of artistic novelties in fancy goods, clocks, bronzes, and articles of vertu and ormolu for which his house is so justly famous.

Inventions and Improvements.

Geo. Hills and Dwight B. Hills, Plainville, Conn., have patented a clock case. They claim in a clock case, a sheet metal back, having a double rim with annular recess inside said rim, the rim forming the edge of the back.

A patent has been granted to Herman Bender, St. Louis, Mo., for watch regulators. He claims in a watch regulator, the combinaton, with a regulating screw or shaft and yoke, carrying a pointer or arm of a projection, pivoted plate or lever and stud,

A new sleeve button link, devised by Mr. Charles Hein, of Corona, N. Y., consists in a double hook and locking bar, pivoted to each other at the center of the link in such a way that the ends of the said bar may be sprung into grooves in the said hooks.

Louis Heckman, Wrentham, Mass., has been granted a patent for wire trimming for jewelry. He claims a trimming or basis for trimming for jewelry, consisting of a wire provided with a continuous series of flattened surfaces at right or other angles to each other.

Mr. S. Cottle, of this city, has invented an improved process of making collar or sleeve buttons, which consists in striking up and drawing out the central portion of a circular metallic disk to form a hollow post, then severing the conical end of the post and soldering the head upon it.

Mr. Wm. Riker, of Newark, N. J., has invented an improved process of making finger rings, by which with few manipulations he is enabled to produce a solid gold ring having inlaid designs of different colors of gold, while its groundwork, edges, and internal periphery are of uniform color and quality.

A patent for winding clicks for watches has been issued to Charles T. Higginbotham, Springfield, Mass. The invention consists in providing a means of letting down the mainspring of watches by means of a click, provided with a tail or projection, a plate, having a slot or recess therein, the ratchet-wheel, and the click-spring.

Eyeglasses is the subject of a patent issued to Jacob F. Traub, Detroit, Mich. He claims in spectacles or eyeglasses, the combination, with recessed studs attached to frames, of slotted plates, secured in the recesses in said studs by screws, and a spring passing through the slots in the plates, and fastened at its ends in the said recesses.

Mr. W. Parkin, of Taunton, Mass., has patented a convenient beverage holder, for ice-water, coffee, tea, etc., which is adapted for use on family dining tables or in restaurants. It is a vessel of cylindrical form and ornamental appearance, provided with a pump, and also having a lining or inner cylinder, between which and the shell of the holder is a dead air space to prevent the conduction of heat.

An improved actuating machine for calendar clocks has been patented by William S. Shirk, of Anderson, Ind., which consists in a novel arrangement, in the time movement of a calendar clock, of a system of levers, springs, pawls and ratchets, whereby the accurate movements of the indicating hands are effectually secured; and in certain details of construction which render the calendar more reliable in its operation.

La Nature says that a French inventor has recently proposed a perpetual clock, based on the difference of atmospheric temperature by day and by night. The heat of day causes a liquid to rise into a reservoir, whence it falls by gravity, so operating the mechanism. This is a very old idea. More than twenty years ago we saw a form of a perpetual clock in this city which was wound by the diurnal rise and fall of a column of oil.

Albert K. Hawkes, of Austin, Texas, has patented an improvement in eye glasses, in which the spring that connects the two lenses is made in two parts, which are connected so as so admit of adjustment for the purpose of shortening or lengthening the spring, and thereby correspondingly increasing or diminishing its strength, for the purpose of causing it to press on the sides of the nose of the wearer with greater or less force. The glasses can thus be adapted to different sized noses and worn with greater comfort.

A watch-winding device is the invention of Benj. Wormelle, Brighton, Mass., for which he has received a patent. He claims in a detachable watch-winding device, a pipe, constructed with a flange, the top of which forms the part disk or base, in combination with the hinged flange, which completes the full base or disk of the winder. The combination, with the pipe and the disk or base formed of the flanges of the thumb-piece. Attaching the flange and thumb-piece to the pipe by means of the joint-spring wire, fitted in the peculiarly-shaped bore in the pipe. The slit at the inner end of the thumb-piece.

An improved bracelet fastening has been patented by Leon Von Praag, of New York city, which consists of an elliptical band formed of a strip of spring metal which may be of any desirable shape or configuration. To one of the ends of the strip of which the bracelet is formed, a concave plate is soldered, so that one-half of it projects over the end of the strip. In the projecting portion of the concave plate, near its edge, there is a hole for receiving a hook that projects from the bracelet strip near the plain end. The bracelet is fastened by slipping the plain end under the concave plate, and inserting the hook in the hole. The bracelet may be easily fastened and unfastened by one hand.

M. S. Smith & Co., of Detroit, have again evinced their exquisite taste in the publication of an illustrated catalogue of American watches and sterling silver ware, which is one of the most artistic guides we have seen. It contains illustrated descriptions of the various makes of Waltham watches and cases, including examples of decoration, and also some valuable information as to E. Howard & Co.'s watches. Next in order is a list of articles made in Sterling silver by the Gorham Co., illustrated with handsome cuts. The volume concludes with a brief and well written article on diamonds, with cuts of famous stones. The frontispiece is a gem in itself and betrays the skillful touch of the Gorham artist, and the entire work is unique in tasteful get up and excellence of contents.

The Ansonia Clock Co.—When attention is called to the fact, that since the re-organization of this company an almost exhaustless inventive genius has been displayed in bringing into the market novelties which are sure to enliven the fall trade in this particular line of business, we are confining ourselves to a statement in strict accordance with truth. An inspection not only affords a surprise in regard to novelty, but also as to good taste and cheapness. Among the articles which deserve mention are the "Birdseye" clock, of 2½ inch diameter, in neat nickel-plated case, stem-winder and setter; a new device for locating the mainspring has enabled the designer to produce this clock of a size approaching that of a watch; a carriage clock, bearing a close resemblance to the imported French article; a striking imitation of the various designs of French marble clocks, with enameled dials, eight-day movements, striking and repeating the hour and half-hour, which can be set backward without derangement, and a setting in beat device. By the introduction of goods of the above description a new impetus is given to the clock trade, and the energy displayed by this firm cannot fail to have a beneficial effect on this branch of industry.

THE jewelry store of Wm. J. Tracy, Burrillville, R. I., was robbed on the night of the 7th of August. Among the goods stolen were the following movements and cases: H. H. Taylor No. 213278; Nat. Elgin Watch Co. No. 462223; Nat. Elgin Watch Co. No. 460453; Nat. Elgin Watch Co. No. 373931; J. T. Ryerson No. 307578; Crescent Street No. 553907; Crescent Garden No. 587696; P. S. Bartlett, stem-winder, 778571; P. S. Bartlett No. 862663; P. S. Bartlett, ladies, 1025838; Wm. Ellery, ladies, 890010; Wm. Ellery, ladies, 861409; Wm. Ellery, O. S., 867894; Tremont Watch Co. 9593; Home Watch Co. 864033; Broadway, 848620; Broadway, 1074090; Broadway, 1074251; Miller, 35503; Miller, adjusted, 35742. E. Howard & Co.. stem winder, No. between 35000 and 36000, in 18kt gold hunting case, been worn about 3 years. 1 14kt. gold hunting case M. B. Crescent Street, No. 17340; 1 14kt. gold hunting case, M. B., 18 size, No. 15967; 1 14kt. gold hunting case, M. B., ladies size, No. 15746: 1 18kt. gold hunting case, M. B., ladies, 16918; 1 Ladd hunting case, ladies, 37415; 1 Ladd hunting case, gents, 40312; 1 Ladd hunting case, gents, 32427; 1 Ladd open face case, 51061. The town of Burrillville will pay a reward of two hundred dollars for the arrest and conviction of the thieves, and Mr. Tracy will pay a like amount for the recovery of the property. Send information to Wm. H. Ayer, Chief of Police, Providence, R. I., or to Wm. J. Tracy, Burrillville, R. I.

Historical Notes.

Several chronometers, used by Captain Cook on his voyages, are in the possession of the Royal Society of London. They were exhibited as objects of interest at one of the soirees a year or two ago, and were very much out of order.

The assay of gold and silver is said to have originated with the Bishop of Salisbury, Royal Treasurer to Henry I.; but some sort of test was adopted from the earliest times, and this test was probably by means of the *touch*, that is, by judging of the quality of the metal when rubbed on a stone. This method is still in use for ordinary purposes, and a practiced eye can immediately detect the quality of alloy by the shade of color of the metal so transferred to the touchstone.

When Jove released Prometheus from the bonds by which he had been confined, he condemned him, as a sort of penance—perhaps somewhat after the fashion of a modern ticket-of-leave—to wear upon his finger, as a ring, a link of the iron chain that had bound him to the Caucasian rock, in which was set a fragment of that rock itself. In this way, so fable goes, the custom of the finger-ring originated. There is every reason to believe that this use of the engraved stone began with the Greeks, and from them was copied by their servile imitators, the Romans. It is every way a convenient and a natural one; and our grandfathers' custom of wearing their seals at the fob, as it was called, or hanging from the side-pocket, was a recurrence to old Assyrian usages, which did not long hold its ground.

The most ancient and most wondrous in the long catalogue of famous rings recorded by the writers of antiquity, is that of Gyges, the Lydian. Plato relates in his "Republic," how he, when a mere shepherd, espied, in a chasm opened by the winter rains, a monstrous horse of brass, which served for the sepulchre of some giant of old, which chamber of death he boldly entering, took off the skeleton finger a ring. Returning to his brother shepherds, he found accidentally that by turning the face of this ring inside his hand, he became invisible; whereupon, profiting by its mystic power, he murdered his master, King Candanles, and took possession of his Queen and kingdom, the most beautiful woman and the wealthiest region of all Asia. The crime was, after the Eastern fashion, visited upon the head of his innocent descendant Crœsus.

In the time of Charles II. the standard for gold was fixed at 22kts., and this remained the only one until 1798, when a lower standard was introduced and gold of the quality of 18kts. had its first official existence. The mark of the higher of these two standards is a lion passant; that of the other, a crown and the figures 18. Hence all gold articles stamped with the "lion passant" of the English assay offices, are to be considered as gold of 22kts. This noble animal, however, is a mark for standard silver, and in consequence an opening was given to designing individuals to impose on the queen's unwary subjects; for silver articles having on them this sign, only required a touch of the gilders art. When lo! the veritable "lion" of the Goldsmith's Hall, transmuted the silver into gold. With the increased use of the precious metal, a change became requisite, and in 1845, the "lion passant" was deprived of his honorable post as a standard mark for gold—the less ambiguous "22 and a Crown" taking his place.

In making gold, Charles Mantelman, a Suabian by birth, simply bored holes in lumps of coal, filled these holes with gold, closed them up with black wax, and threw these lumps into the crucible when the masses were in full fusion. He was detected, however, and cruelly beheaded and quartered at Regensburg, about 1760. Another worthy, one George Honauer, met with a similar sad fate, a few years after, at Stuttgart, where he was hanged. This ingenious gentleman always traveled with a large chest, with a double bottom to it, concealing his own son, a sharp lad of about 10, who used to come out from his hiding place at night and put the gold into the crucible, in which the mass was in fusion over the laboratory fire. Honauer pretended that it was indispensable to leave the mass a few hours to itself, and the laboratory was, therefore, always carefully locked up for the night. The poor boy on one occasion caught a cold in his head, and his irrepressible sneezes led to the detection of the trick. Another, a Swiss adept, used to stir the fused mass with sticks of wood deftly bored at one end and filled with gold which readily dropped into the mass. A servant of his always managed to put a few of the sticks so prepared upon the bundle of wood which his master used to stir the mixture with. This trick was also detected in the end and visited with condign punishment.

Charlemagne was crowned Emperor of the West by Pope Leo, on Christmas Day, A. D. 800, in the Church of St. Peter's, Rome. His crown may, therefore, have been made in that city for the occasion; certainly its ornamentation has more of the Byzantine than the Frankish style. It is octagonal, formed by eight plaques of gold, with round tops, which thus make a scalloped border to its upper part. Each alternate plate bears the figure of a saint in enamel. The first plaque is set with large stones *en cabochon*, and others cut square after the fashion of table diamonds. Above all rises a Greek cross also set with large stones; gems of less importance are equally interspersed upon the other plaques. From the cross springs an arch like a flying buttress, which gives stability to the entire fabric. Frederic Barbarossa, in the year 1166, canonized Charlemange, and took advantage of the occasion, even if he did not create it expressly, to despoil his sepulchre of the crown, besides the enormous amount of treasure, infinitely magnified by tradition, there deposited—the golden throne, the two shields of gold, etc. Since that time the relic was used at the coronation of the succeeding German emperors, and the Elector Palatine had the custody of it *ex officio*. The Austrian Francis, as the last in the imperial series, had possession of the crown, and took good care to retain it; it now rests in the Imperial Library, Vienna, a mere monument of antiquity.

Apropos of this golden epoch and age of silver bonanzas, we learn from the most reliable sources of information that from the earliest times to the commencement of the Christian era the amount of precious metals obtained from the surface and mines of the earth is estimated to be $4,000,000,000; from the latter epoch to the discovery of America another sum of $4,000,000,000 was obtained; from the date of the latter event to those of 1852 an addition of $9,000,000,000 was made; the extensive working of Russian gold mines in 1843 added to the close of 1842 $1,000,000,000 more; the double discovery of the California gold mines in 1848 and those of Australia in 1851, added to the close of the last year $5,000,000,000, making a grand total at the present time of $23,000,000,000. The average loss by abrasion of coins is estimated to be a tenth of one per cent. per annum, and the average loss by consumption in the arts and destruction by fire and shipwreck at from $2,000,000,000 to $8,000,000,000 per annum. The amount of the precious metals now in existence is estimated to be $13,000,000,000, of which gold furnishes $7,000,000,000, and silver the remainder. Of the amount now in existence, $8,000,000,000 is estimated to be in coin and bullion, $3,000,000,000 in watches, and the remainder in plate, jewelry and ornaments. Of the amount now in existence, $7,000,000,000 is estimated to have been obtained from America, $3,000,000,000 from Asia (including Australia and New Zealand), $2,000,000,000 from Europe, and the remainder from Africa. Prior to the commencement of the Christian era to the discovery of America it was $3,000,000; in 350 years it attained $25,000,000; during the decade immediately succeeding 1842 to 1852 it was $100,000,000, and since the double discovery of the Callfornia and Australia mines, 1853 to 1872, it has averaged $256,000,000. The annual product of the precious metals attained its acme in 1853, when it was $285,000,000. The increase in the amount of precious metals in existence has been greater than during the previous one hundred and forty. With such magnificent results before us, is it not singular that California and the Pacific Slope do not cut a more imposing figure in the world of commerce?

Trade Gossip.

Ten dozen cameos were recently seized in the mails.

Roman pearl beads and mother-of-pearl ornaments are taking the lead.

C. E. Hoffman, jeweler, Lebanon, N. H., has sold out to Frank Morgan.

H. G. Lutsey, formerly of Shawano, Wis., has removed to Clintonville, Wis.

Buder Bros., formerly of Cairo, Ill., have opened a jewelry store in Columbus, Miss.

Daniel S. Cooke & Co., of Providence, have dissolved. O. M. Draper continues the business.

Belts are now ornamented with quaint designs. Some are made of pearl, others of jet, and still others of silver.

Willis H. Ward, Boston agent for the Hampden Watch Co., has been arrested on an alleged charge of embezzlement.

Necklaces are composed of different sized silver coins, washed with gold, surmounted with the monogram of the wearer.

New combs for the back hair are no longer high and towering but show merely in a single row of jet, silver or pearl beads.

East Indian silver ware, with elaborate and exquisite engravings of native personages and deities, is shown at Tiffany & Co.'s store.

It is stated that a Bedford County jeweler has secured a patent for a lock and key, and has refused the sum of $10,000 for the right to it.

Silver filigree, real and imitation, is selling in a variety of ornaments. A new necklace in this work has jet set in the band and jet drops.

A tiny thread of gold supporting a solitaire diamond is the latest style of engagement ring. It is so everlastingly sweet, and so easily broken.

A necklace worn by a St. Louis lady at a watering-place, is composed of silver quarter dollars washed with gold, with raised monograms riveted in.

The richest novelty in fans is of gold, wrought in a delicate open work, like the Chinese ivory fans. The most expensive have the owner's name in diamonds.

Le Roy W. Fairchild & Co. have just introduced a novel magic pencil charm representing a top. It is made in gold, silver and rolled plate; also a fac-simile of the celebrated J. pen, in gold.

Assyrian, Egyptian, Persian and Japanese designs appear upon studs, sleeve buttons, and scarf pins of varying colored gold, caused by the application of different degrees of heat, producing a most handsome effect.

The firm of Brainerd, Steele & Co. have dissolved in consequence of the death of Mr. A. Brainerd. The successors have re-organized under the firm name of Brainerd & Steele, and will conduct business as heretofore at the old establishment, No. 9 Maiden Lane.

President White, of Cornell University, writes from Paris as follows: "Perhaps the most striking thing has been the taking of the grand prize for artistic gold and silver work by Tiffany. Splendid as the Exhibition was in this respect, Tiffany stood above all his rivals."

Messrs. Colby & Johnson have originated the use of celluloid in the manufacture of watch cases in combination with silver; and this new departure promises well. The center stem and bow are in silver, while the back is made of celluloid, "snapped on." The combination is very effective and answers well for open face watches.

All the old and valued gems have re-appeared, and many stones that have not been worn for years are now in fashion; among them are the dark Swiss topaz, carved in cameo, scarabeil, jasper, lapis lazuli, and malachite, as well as the always popular black onyx, sand-pink topaz, and the beautiful peridot, a chrysolite of a light emerald color.

The well known and enterprising firm of Chatterton & Dodd have just brought out a new and beautiful article of ladies' jewelry which is so handsome and appropriate that it cannot fail of becoming popular. It is in the nature of a charm, and consists of a handsome ornament that serves as a boot and glove buttoner; attached to this, by a gold chain, is another ornament, which, placed in the buttonhole, converts the whole into an elegant and very desirable article of personal adornment. The buttonhole ornament is made in various designs, yachts, sporting caps, whips, etc., some of which are enameled in various colors. It is a new and novel article of jewelry, combining the useful and the beautiful with good effect.

Edward Hobun, a clerk with Thomas Steele & Son, jewelers, of Hartford, Conn., recently robbed his employers' safe of some $1,500 worth of watches and made his escape.

The American Watch Company's display at the Paris Exposition continues to attract thousands of interested spectators, and is said to be one of the finest individual exhibits in the American department.

A new water set at the Meriden Company's is in French gilt and steel The pitcher is smaller than formerly, as also are the goblets and bowl. The server is ornamented in star decorations and covered with a heavy glass to preserve it from scratches and defacement.

Samuel D. Clapp, of the late firm of Felloms, Holmes & Clapp, at No. 12 Maiden Lane, has gone into voluntary bankruptcy before Register Dwight. His liabilities amount to $99,000, and he has no assets. Among the creditors are the National Citizens' Bank, $12,200; Bank of the Metropolis, $3,464; American Optical Co., $5,260; M. T. Baldwin, $4,500; R. Schell, $33,250; Mr. Cockroft, $8,387; S. P. Mockridge, $4,054.

Mr. Henry Fera, a diamond merchant of this city, has returned from abroad and has brought with him a very fine specimen of Cape diamond in the rough. It is said to be exceedingly well shaped, of remarkable purity and perfectly free from flaw or blemish. The gem weighs in the rough about 16 carats, but Mr. Ph. J. de Bruin, the well known expert, to whom it has been submitted to be cut and polished, hopes to convert it into a 9 carat brilliant, such as has never been seen in this country.

In an article on the diamonds of South Africa, in *Scribner's Magazine*, Dr. Morton says that the cleaning, cutting snd polishing of the rough stone can now be done as well here as abroad, or as I believe, judging by results and from the testimony of experts) better. Stones cut in Europe are frequently remodeled and repolished in this country, thereby gaining much in value, and others, abandoned in the rough as not worth cutting, are here converted into excellent brilliants. The credit for introducing this industry is due to Mr. Henry Morse, of Boston, and Mr. Hermann, of New York, who yet remain the only competitors.

Mr. Thomas G. Brown, one of our best known manufacturers has just completed for the National Association of Amateur Oarsmen, ten beautiful medals. They are elegant in both design and finish, and reflect great credit on the artistic skill and ability of the manufacturer. The most artistic one of these medals is for the "Junior Singles." It contains the legend of the Association in a circlet of Roman gold. On the outside twines a wreath of laurel. The center is a sea-shell of platina, in which stands the erect figure of a sculler holding a pair of sculls. On either side are water-lillies and aquatic cattails. The medal is suspended from two bars of gold to which it is connected by a heavy gold chain. The bars are of delicate workmanship, and appropriately inscribed. The other medals are exceeding appropriate, and constitute trophies of which any contestants may be justly proud.

Alfred Winters, a clerk in the employ of Rosenkrans & Co., Milwaukee jewelers, has been arrested on an alleged charge of robbing his employers. A few days ago the suspicions of the firm led to an investigation, when it was discovered that a large amount of jewelry was missing. During Winters' absence in Chicago his trunk was examined and found to contain jewelry and diamonds to the value of about $4,000. Since then he has given information of six different packages which he had lately forwarded to Chicago. Some of them, aggregating $4,000 have been recovered. He had also sent several packages of gold watches and solid gold jewelry to smelting and refining works, in that city, to be reduced. The total value of the property stolen will probably exceed $10,000. Winters has been in the employ of Rosenkrans & Co. about nine months, and he had the entire confidence of the firm.

In the window of Oelschlaeger Brothers' philosophical instrument store, in William street, is a working model of a new machine, which is regarded by some spectators as a near approach to perpetual motion. However, it is turned by the power of light. It is the invention of an Englishman, and consists of four disks attached to arms radiating from a central revolving post. One side of each disk is painted black and the other white. The black surface absorbs and the white surface repels light, thus revolving the machine. In order to avoid friction with the atmospnere, the machine is placed under a glass cover, from which the air has been exhausted. It is not heat that moves the disks; and that the motive power is light alone is proved by the fact that the machine will work even if placed in an ice house. The light of a candle will cause the machine to revolve slowly, and a calcium light will incite rapid revolutions. The model on exhibition is worked by ordinary daylight, but is not touched by direct rays of the sun.

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THE

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THE RECOGNIZED ORGAN OF THE TRADE.

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The State of Trade.

WHILE there is generally a more hopeful feeling in all branches of trade at present regarding the future, there are many who are apprehensive that the "greenback craze," which has come to the front so prominently within the past few months, will again demoralize the finances. We are not of the latter class. The greenback movement we regard more as the hobby of a few political demagogues who hope to ride upon it into place and power than anything else. Their followers comprise those classes in the community, as a rule, who have everything to gain and nothing to lose by any change, whatsoever its nature, whether in the laws governing the finances of the country or those which regulate society. Their leaders are demagogues and mountebanks, who, should they succeed in obtaining power through the instrumentality of the greenback platform, would have no hesitation whatever in repudiating the platform, and the men who sustained them, at a moment's notice, when any other course was temptingly opened to them. The solid business men of the country, the capitalists and property-owners, are in favor of hard money, of a currency based on gold and silver, to the redemption of which the faith of the nation is pledged.

There is little danger that the present policy of the government will be changed. Specie resumption has been ordained by Congress to go into effect on the first day of January next. Although strenuous efforts have been made at several sessions of Congress to have the Resumption act repealed, these have failed to accomplish the end sought, and the resumption law still stands. The policy of the government for several years has been taking shape to enable the law to be carried out to the letter. The President and Secretary of the Treasury say they are prepared to resume specie payments at the time specified, and there is no doubt but it will be done. Before Congress can assemble to meddle with the finances, the fall elections will be over, and the war-cry of the greenbackers silenced for a time, and, as resumption is found to be successful—as, no doubt, it will be—they will gradually disappear. The issue is raised by demagogues for personal ends, and the disease will be as short-lived as it has been acute.

The apprehension that Congress may interfere with the policy of specie resumption seems now to be almost the only obstacle to a return of prosperity. There never was any tangible reason for the general demoralization of business that has existed since the panic of 1873. Inflated bubbles were then punctured, but the producing capacity of the country, wherein lies its actual wealth, was not impaired. There was and is plenty of money with which to do business; the banks are loaded down with it, and the rates of interest have seldom, if ever, been so low as during the past few years. But the panic frightened everybody, and there was a universal loss of confidence. Credit was destroyed, and business came to a standstill. There was no necessity for this, and business men are beginning to realize that fact. Capitalists are looking for new investments, tired of having their money lie idle; confidence is slowly but surely being restored, and the prospects for a gradual recovery from business depression and stagnation are favorable. If Congress, at its next session, will keep its hands off of the financial policy of the government, and omit its customary tariff tinkering, it will do more to build up confidence among business men, and restore prosperity to the country, than anything it has done in ten years.

Send in your Orders.

THE past month has shown a very considerable increase in the volume of business in the wholesale trade, and the indications are that there will be a steady increase up to the holidays. We would, therefore, advise country dealers to send in their orders at the earliest possible date, and not delay them until others have had the pick of the most desirable styles and patterns. Those who are the most wide-awake will secure the pick of the new goods leaving for the dilatory ones those which are the least salable. The fall trade will not, probably, come in a rush, as is customary, on account of the devastation wrought by the yellow fever in the south. Until after frost has appeared to kill the disease, there will be no attempt on the part of southern merchants to either buy or sell. Their trade is, therefore, likely to be protracted until the holiday season. At the same time, manufacturers and jobbers will be busy with their local trade, and country dealers will find themselves receiving less attention than usual. It behooves them, consequently, to get the best of the market at as early a date as possible. When the holiday trade once commences the manufacturers have no time to make up goods to supply broken lines. It is important, from every point of view, that in order to secure a wholesome, healthy fall trade country dealers should send in their orders promptly that they may be filled without delay.

The practice of sending out goods on memorandum is one that will be followed less this fall than for many years previous. While it has been of benefit to retailers it has tended to break up the stocks of wholesalers leaving them for a time deficient in choice lines. Then, after the busy season was over, these memorandum goods have come back on their hands, loading them down at a time when the opportunity to sell had passed. It has been a pernicuous practice at all

times, leading to many entanglements. Retailers have taken advantage of it, ordering on memorandum goods which were unsuited to the market they catered to, while wholesalers, in their eagerness to sell, have thus placed their goods recklessly, thereby depriving themselves of the opportunity of disposing of them through other channels. There are times when it is unavoidable, but the practice, as a rule of the trade, is "more honored in the breach than the observance.' There is a strong disposition to draw the lines more closely in the future; the more closely the better it will be for both buyer and seller.

The Collapsed Convention.

WHILE we had hoped, almost against hope, that a better understanding in the trade would result from the discussions in the convention,we are not surprised at the collapse of the plan proposed. Nor is it much to be regretted that it has failed. In attempting to define "what constitutes a jobber?" so much latitude was given to jobbers that there was little left for the retailers. The rights of the smaller dealers were almost entirely ignored, and such advantages given to those who choose to call themselves jobbers, that they would have been at liberty to scour the country in search of retail trade. Perhaps such was not intended; but the plan proposed would have to have been lived up to most religiously, as well in its spirit as to the letter, to have made the line of demarcation between jobbers and retailers perceptible to the ordinary observer. Experience has demonstrated that dealers, so far from observing the spirit of any regulation imposed upon them, take to themselves the widest latitude and the most liberal interpretation possible of the language of such regulations. Having this fact forcibly presented to us, we had but little hope that the plan proposed by the convention would revolutionize the trade or place it upon a better footing.

As before stated, the action of the convention has been entirely overturned by the impossibility of arranging the matters of detail necessary to carry it out. It is not necessary for us to intimate just where the difficulty lay, or with whom the responsibility for failure rests; it is sufficient to state that the whole scheme has failed—fizzled out—most ignominiously. The jewelry trade is, therefore, regulated to its former chaotic condition, and the cut-throat policy heretofore pursued with such disastrous results, is likely to once more become prominent. The favored petty jobbers of the West will flood the country with circulars, offering all classes of goods to customers at jobbers' rates, and, sample box in hand, will scour the land in pursuit of some one to take their goods off their hands at any price. Having the advantage of buying from the manufacturers at jobbers' rates, they can undersell the retailer at all times, and steal away his customers. This is demoralizing, of course, to the retail trade; but, as the manufacturers have failed to secure to them that protection to which the retailers are entitled, there seems no remedy for it. It will now be in order for the retailers to call a convention and adopt a platform setting forth upon what conditions and under what circumstances they will purchase of manufacturers. If they should attempt to define "What constitutes a jobber?" we have no doubt they would draw the line so clearly that manufacturers, jobbers and retailers could distinguish it with equal distinctness. It would not be a very hard matter to get such a convention of retailers. Let some aggrieved person send out circulars asking each city to send delegates to such a gathering, and enough would respond to give form and voice to their grievances, and in tones that would compel the attention of the trade in general. If the cutthroat game is indulged in by these retailing jobbers to too great an extent, a combination of retailers against both jobbers and manufacturers may result. In such a fight the manufacturers would be compelled, for self-protection, to side with the retailers; for, after all, they are the main dependence of the trade, and the medium upon which the manufacturer must depend for the sale of his goods to the actual consumers. Whatever weakens them or impairs their standing or credit, is felt at once by the manufacturers, and it seems to us short-sighted policy on the part of the latter that leaves the retailer at the mercy of the interior jobbers.

Express Companies.

EXPRESS companies are common carriers; that is to say, they are under obligation by the law of the land to carry parcels for any person who asks that service, and is willing to pay their reasonable charges. Moveover, unless the company can get him to make a special agreement to different terms, they are responsible, in case a parcel is lost, to pay the value of it, unless they can show that it was taken from them by some military force in arms against the government, like the raids of the Confederate States, or was destroyed by some cause that human foresight could not avoid, like a stroke of lightning. Antiquated English lawyers used to say that carriers were liable except for the act of God or of the king's enemies, but the American people have no king, and do not consider it reverent to speak flippantly of the act of God, so they have substituted the phrase, except for inevitable accident, or the act of a public enemy. But the rule is the same. It is no excuse to an express for losing a parcel, that robbers took it away from their agent; for robbers are not public enemies; nor that it was burned by their office taking fire, for this is not inevitable accident.

Yet they may save themselves from this rather severe liability by making a special contract when they take a parcel; and here is where opportunity for some curious cheats upon these companies has arisen. There is, to be sure, some sharp practice upon their part; for the companies are always trying to lead one who deals with them into making a special contract, without knowing it. You carry a parcel to the express office, the man behind the counter takes it and begins to write away upon a printed blank. "How much is it worth?" he asks. Well, your mind is not made up beforehand on this particular point; you do not know to a cent what it is worth, nor, indeed, why he asks the question. Never mind, while you are thinking he hurries on writing, slaps a piece of blotting-paper across the leaf so that you can hardly read a word, hands you the receipt, and takes the next parcel. When you get home and examine your paper you find that he has written in the talismanic words, "value asked, not given," and that the paper contains, in fine print, a clause saying it is a special agreement between you and the company, that you are not to have over fifty dollars for their losing your parcel, unless you have disclosed its being of higher value and paid extra expressage for sending it

Now, the courts have held that this way of doing business is in effect asking the man who sends the package whether or not it is worth more than fifty dollars, and that the company has the right to know this so that they may take adequate care of the parcel according to its worth. If the agents of the company ask, even in this vague way, they have the right to be fairly informed. Several curious lawsuits have arisen on this point. In one case the owner of a quantity of valuable jewelry wished to send it by express, but was afraid he would be charged high expressage if he disclosed its value. So he packed it shabbily, carried it to the express office, declined to answer the question as to value, and the agent took it at the cheap rate. But it was lost, and when he sued for damages the court held he could only recover the fity dollars. The same rule was adjudged in a case where glass-ware was packed in an ordinary way, and its character purposely concealed from the express company lest they should charge extra. They sent it without the special care appropriate for glass, and it was broken. The Court held the owner could not recover its value.

But if the express company does not ask the value, the owner is not bound to volunteer to tell them. There was a case where a noted firm of silverware manufacturers packed some valuable silverware and gave it to a cartman to carry to the express office. But the cartman did not know what was in the parcel. When he reached the express office, behold, there were two counters, one for receipt of ordinary merchandise, and one for money and valuables. He knew no better and meant no harm, and handed it in over the ordinary counter. It so happened that the clerk neglected to ask what was the value. The parcel was lost. When the manufacturers brought suit for the value, the Court held that as the value was not asked, and no deceit was practiced, they were not limited to fifty dollars, but could recover the full value. Verdict for the plaintiff's. Moral: when one carries a parcel to the express office, he must act honestly and answer truly what questions are asked him about value, or be content to risk all above fifty dollars. But he is not bound to tell if he is not asked.

The Plague-Stricken South.

THE yellow fever continues its ravages in the Southern cities, carrying off its victims by the hundreds daily. There is no prospect of its ceasing its ravages until frost comes to kill the germs from which it springs. Meantime the survivors in that decimated region are in a most pitiable condition. Not only has death visited almost every household, but all kinds of business has come to a complete standstill. While the necessities of the people have increased, their means of providing for them have been cut off. But never have persons in affliction been more generously treated than they. Contributions of money, clothing and provisions have poured in upon them from all sources. Not a community or organization of any kind, and scarcely an individual, but has contributed something to the relief of the sufferers. More than this: brave and self-sacrificing men and women have hurried to the plague-stricken districts, nursing the sick, comforting the dying, burying the dead, and finally giving up their own lives in behalf of these suffering ones. The humanity of mankind was never better exemplified than in this instance. Christianity never had bolder or more devout hero-martyrs than those who have gone forth to the infected districts and died for their fellow-men.

While all communities, trades and professions have been liberal in their contributions, the jewelry trade has not been behind the others. They have given freely and liberally, each according to his means. But the necessity for giving has by no means ceased. For weeks, even after the fever has ceased its ravages, business cannot be revived; and meantime the suffering and distress will continue. While our people have been doing so much, we would suggest that their foreign competitors should also aid in the good work. There are many of these in the jewelry trade who anxiously seek Southern custom; let them show their appreciation of Southern people by aiding them in their hour of need. Any contributions sent to the office of the CIRCULAR will be at once turned over to the Jewelers' Association, and forwarded to the charitable organizations in Southern cities. We should be glad to see our English contemporaries mention the fact.

An Instructive Essay.

THE *Scientific Observer*, of Boston, contains an interesting paper by S. S. Chandler, jr., on a new method of finding the time without instruments. He says: "Let two plumb lines be suspended at a considerable interval, say two or three feet apart, in a direction nearly north and south, and of such length that the eye, placed near the lower end of one of them and looking toward the other, can observe the transit of stars across the latter up to an altitude of say at least fifty degrees. Let the points of suspension be movable laterally, so that the lines can conveniently be brought into the same plane with the polar star, by so adjusting them that the eye, placed at a little distance from one sees it projected as against the other and the pole star at the same time. It is evident that in this position a plane passing through the lines will cut the sphere in a vertical circle, the angle between which and the meridian is the azimuth of Polaris at the time of observation. If now the observer reverses his position, and the eye be placed in front of the northernmost line, so that, looking toward the south, it appears projected on the other line, and the time be noted when a northern fast-moving star appears bisected or occulted by the two lines, we have the means of ascertaining by a slight calculation the error of our time-piece. In this manner the transit of several stars may be observed in the space of half an hour or so, adjustment being made on Polaris at each observation, thus giving as many independent results." The formulas for reducing these observations involve only a slight knowledge of trigonometry and a copy of *The American Ephemeris and Nautical Almanac*, and can be greatly simplified by the calculation once for all of two constants. Mr. Chandler gives tables of these constants for Boston, and also works out a practical illustration of the method, in which the time was ascertained correctly to five seconds.

Encouraging Youthful Efforts.

DORMANT abilities are often developed by a spirit of emulation, and, with the view of creating this spirit among their apprentices, and to encourage youthful efforts, Messrs. Tiffany & Co. last summer offered a number of prizes of money for excellent specimens of workmanship executed entirely by the apprentices in the several departments of their extensive silverware workshops. Prizes for chasing of cast metal work, *repousse* chasing and engraving, as well as for original designs for several articles of household silverware were the principle items. The competitive objects present evidence of the fine abilities of the young artisans. The *repousse* specimens are plaques of silver about six inches square, and the designs are mostly of a floral character, some being treated in a purely conventional manner, while others emulate with great reality such familiar flowers as grow in our gardens and greenhouses to-day. The specimens of engraving are all conventional forms of decoration, the composition being well selected and tastefully combined. The strongest effects open to the gravers' art are evinced in some of these pieces, and though less interesting than the *repousse* work, they still have many valuable elements of decoration. The designs and specimens were handed in at the beginning of the current year, and the judges were selected, one by Messrs. Tiffany & Co. and one by the competing apprentices.

The following are the names of the successful aspirants:

Design for a soup-tureen—$40, C. Tellier. Design for a teapot—First prize, $20, J. Hahn; second prize, $15, F. Schmidt; third prize $10, J. Curran. Chasing of cast metal—First prize, $10, O. J. Liess; second prize, $5, R. Scheuer. *Repousse* chasing—First prize, $20, A. Tallichet; second prize, $15, E. A. Bauer; third prize, $5, L. Meisched. Engraving on silver—First prize, $10, T. Haymer; second prize, $5, G. F. Licht.

The judges appointed to award the prizes for *repousse* work were E. J. Soligny and A. F. Heller, the former of whom chased the Bryant Vase, which was regarded as the most elaborate and difficult specimen of *reposse* work in the International Exhibition of 1876, and the latter is a medal man at the current Paris Exposition.

Inland Customs.

COMPLAINT is made in the trade that the customs officers at interior ports of entry do not enforce the tariff as effectually as the officers in New York are doing. This gives the western importers a very great advantage over their eastern competitors. If an invoice of goods that may be undervalued 15 or 25 per cent. is allowed to pass the custom house at that valuation, of course the person receiving it pays duty at that rate, whereby he is enabled to undersell his neighbors who pay full duty. Or, if the customs officers, through ignorance or criminal collusion, fail to collect the full tariff on goods honestly entered, the importer has just so much the advantage of his competitors. It is asserted that this is habitually done at interior custom-houses, not only as regards goods in the jewelry line, but in all others. If there are such derelictions of duty on the part of government officers, a remedy should be applied at once, for not only is the government robbed of its just dues, but trade is seriously demoralized, and the honest importers, who desire to pay what is right and just to the government, are placed at a serious disadvantage. Honest men, who pay 100 cents for a dollar's worth of goods, cannot compete with thieves and receivers of stolen goods, who pay little or nothing for their stock. So it is in the importing business; the dealer who pays no duties can always undersell his honest competitors.

THE most important event in the trade since the collapse of the jobbers' convention, has been the reduction in the prices of silver cases made by a leading house, and followed by other manufacturers. This leaves the whole business exactly as it stood prior to the cut, save that the profits of the manufacturers are reduced from 10 to 15 per cent., without any increase in sales.

Proceedings of the Horological Club.

A Distinguished Body of Watch and Clock Makers.

Fifty-fifth Discussion.—Communicated by the Secretary.

[Notice.—Correspondents should write all letters intended for the Club separate from any other business matters, and beaded "Secretary of the Horological Club." Direct the *envelope* to D. H. Hopkinson, Esq. *Write only on one side of the paper*, mail as early as possible, as it must be received here *not later* than two days before the end of the month in order to be discussed and reported in the Circular for the next month.]

TERMS FOR TAKING APPRENTICES.

Secretary of Horological Club:

Will you please inform me, through the Circular, what you consider a just recompense for an apprentice in the jeweler's business. I was foolish enough to take in a boy of eighteen on the following conditions: first year, nothing; second year, board; third year, board and three dollars per week. I have found, to my sorrow, that it does not pay. The first year I am out nothing but my time. Yet, what the boy does is nothing compared to waste of time and temper. Of course, the second year it would be better; but I know his services will not be worth board, time and trouble, although the boy is sharp and smart and shows some ingenuity. I have heard that in New York the watchmakers get a premium and pay nothing. Is it so? By mutual consent my boy has left me, and I now wish to obtain another, as I should have one to stay in the store when I am called away. Now, will you please give me your honest opinion. I wish to do as other first class watchmakers are doing and no more. I want to be just, but I think my offer was too much. Yet, if that is what others give, I will give it. Also, inform we what papers, if any, are drawn up. E. L. W.

Mr. Clerkenwell replied that the terms for apprentices, like most other matters, depended on circumstances. If a man was a noted watchmaker, he would charge a premium, according to what he thought his time and instructions worth. But, if nobody was desirous of learning from him, and he must have some one to help him, of course he must pay enough to secure the services of an apprentice, *i. e.*, both sides must do the best they can. There are no regular terms either for paying apprentices or charging premiums. When premiums are given with apprentices wages are also given. But there is not so much done in the premium line in this country as there is abroad, nor in taking apprentices at all. Here, good workmen are averse to bothering with instructing boys; but, if they need help, prefer to hire a competent man at once, and have no trouble.

As for papers, there are all sorts, and some give none at all. The proper way is to make a legal contract between the jeweler and the boy and his lawful guardian, stating in detail the duties and privileges of all the parties, terms, etc., so that there can be no after misunderstanding or disputes. This should be drawn up in proper torm by a lawyer, signed and witnessed, and each of the contracting parties should have a copy. If the apprentice runs away he can be brought back, or his parent or other guardian sued for damages, or both. Either *party* failing to fulfill the contract can be compelled to make the other good. Sometimes the contract specifies a penalty or forfeit to be paid if the apprentice does not do as agreed to the end of his term. If he does, he should require the employer to endorse that fact on his contract. Mr. W. should offer what he thinks is right and what he can afford under the circumstances of his case, and make such papers as will secure him from any loss, if he can. That is about all that can be said.

TURNING BALANCE STAFFS WITHOUT CEMENT.

Secretary of the Horological Club:

Can balance staffs be turned true in any of the American foot lathes without using cement for fastening, but simply placing in the chuck? Some tell me they can. I have one on which I cannot do it. P. P. H.

Mr. Waltham said that the best grades of the American lather were sufficiently perfect to do it, but the ordinary lathes were not. It required perfect fitting of the spindle, bearings, chucks, etc., and proper handling by the workman, A split chuck carelessly used, or on pieces not of proper size for it, would soon be ruined for all perfect working. A good workman with a good lathe could do it, but otherwise it was safer to use a cement chuck.

BRAZING WATCH AND LOCKET JOINTS.

Secretary Horological Club:

Being in the watch and jewelry business for the last twenty-five years, allow me to inform the profession how I put on watch and locket hinges in making repairs, etc., and which I find very convenient. In the first place I take a strip of plate the thickness I want my hinge. This I cut with my shears and turn over a smoothe wire the size I want my hinge, then cut so that the lap will just meet and pound it down and draw my wire. Then slip in a small plumbago pencil point. This makes a core that will not melt. Lay on with the seam down, and braze with hard solder, crowd out the point, and finish up your joint. In doing this I furnish all sizes of wire. I also often use it where I braze and do not want to close up a hole. J. D. F.

Mr. Blowpipe pronounced this an excellent idea. The plumbago would not melt nor burn away, and solder would not stick to it nor run into it. It would, therefore, be very convenient in many cases where a hole was to be kept open while the solder ran all around it, and the flame was blown directly upon it. Many workmen fill up a joint with a piece of wood, for this purpose; but if the heat was continued for any length of time, this would burn away and disappoint the workman. In addition, the acid vapors from the heated wood often prevented the solder from flowing into the lap or joint as it was expected to, by oxydizing the metal. The pencil points spoken of are small, but of course gas carbon, or such as is used in voltaic batteries (if clean and never used,) would answer the same purpose, and pieces could be cut out of any size or shape.

TOOL FOR LETTING DOWN MAINSPRINGS.

Secretary of Horological Club:

I want to tell the readers of the Circular of a handy tool, easily made, for ho ding back the click, to let down the mainspring. Take a common thimble, and cut the top off half way down, then soft solder on to it a tempered piece of chisel-shaped piece of steel half an inch long. Hold the watch in the left hand with this on the forefinger, and the key in the right hand. If you use it once, you would not be without it. L. D. Graham.

Mr. McFuzee thought this would be a very handy tool. Many workmen had to call on some one to help them in such cases. He himself used a small screw-driver with a bone handle, which he held in his teeth, and used for raising the click, or spring, or to move any part when both hands were occupied. But this thimble could be applied with more force than one could give with his mouth, and be fully as handy to use. Almost every one has hit upon some convenient contrivance, and if all would contribute what they had found the result would be an immense number of useful ideas. Each one would receive many fold more than he gave, with no loss to himself by what he had told. We hope our readers will all send in their trade secrets and "wrinkles," for the general good.

FITTING CLOCK DIALS AND CANNON PINIONS.

Secretary of Horological Club:

Accepting the general invitation to write something that may be new to some one, I submit the following: To fit clock dials without breaking or cracking the paint. Place on a board with the figures up, so as not to scratch or bend it, and drill a hole with about ⅛ inch twist drill. Then enlarge the hole to the required size with a rose counter-sink, which can be had at any hardware store (called, I believe, countersink for wood), and trim the hole with a knife. In using the drill and counter-sink heat them over a lamp somewhat hotter than can be held in the hand. Being hot they heat and soften the paint and prevent cracking. It will require a little practice to get the right amount of heat To fit a cannon pinion: Put it into a split or Beach's chuck, in the lathe, and, while running, insert a Stub's broach, to which has been applied a little oil, and in about the time it takes to write it, it will be as large as required, care being taken, or you will overdo the job, as it cuts very fast. Pinion.

Mr. McFuzee added that this was what we wanted. Let every one contribute his quota to the general fund of information, and the Club will undertake to publish it to the trade so that all may be benefitted thereby.

LETTER FROM "EXCELSIOR."—HE DECLINES ALL OFFERS OF WORK, ETC.

My Dear Mr. Isochronal:

I am in frequent receipt of letters written to the Editor of the Circular by dealers and others, who wish to obtain my services in

performing difficult adjustments, making tools, giving advice or instructions, etc. Some of these gentlemen seem to feel hurt because they are not furnished with my address, so that they can send me their jobs, or consult me on points where they are in difficulty. To save both others and myself from useless trouble and loss of time, I wish to say, through the Club, 1st, That, by an understanding with Mr. Hopkinson, with the object of protecting me from endless correspondence and personal interviews, my identity is to be a secret between him and myself. He is, therefore, bound to decline furnishing that information to any one. 2d, It is impossible for me to do any more than I am doing. My time is fully occupied, not only week days, but Sundays also, and I have not had an evening to myself in the last three years. Correspondents will therefore perceive that it is not any lack of willingness to accomodate, but absolute necessity which compels me to decline any and all favors offered me in the way of work, counseling, or giving personal instructions. They will also see that their frequent tender of extra prices, etc., can be of no avail, because, even if I could receive and return their jobs without being known (which would be doubtful), I could not find time to do them without violating previous engagements, which require every hour of my time to fulfill. I have thought it due to these gentlemen, and others who have written before, to reply thus explicitly to their very complimentary letters and offers, and trust that this explanation will show the situation so plainly as to justify Mr. Hopkinson and myself in the course we have to pursue. Several corresponnents seem disposed to take me to task for declining to give instructions in the Horological School, lately proposed at your meetings. I do not see why they should consider me alone responsible for the failure of that project, so long as there are workmen in New York who would be competent and glad to perform those duties. I should be very sorry to think that I had been the means, however innocently, of preventing the foundation of such a school; and I do not acknowledge that the blame will rightly rest on my shoulders if it fails, which I hope it will not. But, however that may be, I am obliged to decline. In all probability I shall be forced to give up a part of what I am now doing, instead of undertaking anything additional. It will not be at all unexpected, to me, if I should have to relinquish the writing of the "Practical Hints," to order to give proper attention to my private business affairs. I think it will be acknowledged that I have done tolerably well—having contributed forty-three consecutive articles to the CIRCULAR, without missing a month. And I take this occasion to remind the trade that possibly same others may have duties in this matter, as well as myself. It is not to be supposed that I am the only one whose duty it is to write. If such articles are of general benefit, let others contribute their experience for the good of the craft. Those who do not feel competent to write connected articles, can send to the Club bits of experience, improvements or discoveries that they have made, etc. It will all come good. A trial wil at least show that these things take time, and that one man cannot do everything, however willing he may be. Let others take hold of the Horological School and push it through to a successful issue, as they can, if they will, instead of blaming me for its failure. If everyone would go to work *himself*, and do what *he* could, we should soon see a vast difference in the condition of the trade, and fewer causes for complaint.

Accept my thanks for your kindness in tending to these matters for me. Very truly yours, EXCELSIOR.

P. S.—I send you a few of the letters, with portions marked. If I have not answered them sufficiently, please do so for me.

[They are as follows, except those referring to the Horological School, which were given to Mr. Regulator to attend to.—Isochronal.]

"I have the work you publish on the Balance Spring, by 'Excelsior,' and it is by far the best I have ever seen. Have you any other practical work on that subject? I am specially and professionally interested in the whole question of Isochronism. I desire to know who 'Excelsior' is. I do not ask from mere curiosity, but would like to get his services in adjusting my line of fine watches. I understand that work practically myself, but would pay liberally if I could have that class of work done by some one I could depend on as A1. From numerous suggestions and cautions in his treatise I can see that he has practically mastered the subject in all its details. If you can consistently give me the information I seek, you will greatly oblige me, and assist 'Excelsior' to a profitable and permanent customer.

"I cannot understand why a workman of his abilities should prefer to remain 'incog.' One would suppose that he would want to enjoy his well earned reputation in his own name. But, of course, that is no business of mine. If you cannot give me his address please state how I can avail myself of his services. If it can be managed without too great inconvenience and delay, I would rather do that way than not to secure his assistance at all. If the pay is the sticking-point, I will say that I will pay anything within the bounds of reason. Let him name his figures, and we can soon settle that.

"Soliciting your friendly offices, an early reply will oblige,

"Yours, etc., G. G. H."

"I desire to ascertain whether I can get 'Excelsior's' services through the parties with whom he works, and if so, will you give me their address? There are no workmen in our city who understand the *fine points* of adjustment, and I have no confidence in nine-tenths of the *professional* class. Very truly, A. V. R."

"I am bringing up my third son at the bench, and this is his seventh and last year. The other two boys are with the —— Watch Co., and this one will have a position as one of their adjusters, on the first of January next. He already has quite an extended reputation for his skill and success, and I mean that this one shall be 'atop' of the heap.' Now, what I was getting at is this: We have Excelsiors book, and it is the best thing of the kind I have ever seen, and I have had fifty-five years experience in England and this country. It has been a great help to us on many a dark point. Now, as I said before, I want this son to be at *the top*, and I propose to let him finish off in Excelsior's own shop. If you will give me Excelsior's name I shall be strictly confidentiai. I want him to give my son two months' close attention, and his money is ready. I expect it will 'cost,' for I know how these things go, in the old country. But I have laid by a little something, as you know, and a few dollars shall not stand in the way of giving my last boy a good 'send off.' Now, you need not be afraid to give me Excelsior's address, for, as I said before, it shall be kept secret."

T. J.

"I have a fine watch that I bought for *the best*, but I find it imperfect in several points. I want to find some competent adjuster to *perfect* it in a few points that I have not the facilities for, myself. I know what is wrong, and how to fix it, but haven't the coveniences. I imagine 'Excelsior' to be ——, of — Nassau Street. Am I right?" etc. The others are similar to the foregoing, except that some want tools made, etc.

EXCELSIOR'S "PRACTICAL TREATISE ON THE BALANCE SPRING AND THE COMPENSATION BALANCE.

Mr. Isochronal said that there were a few points in the letters just read, which Excelsior had not answered. G. G. H. asks if there are any other practical works on Isochronism. He would say that his occupation as adjuster required him to be fully posted on that subject, and he believed he possessed or had read about everything that had been published upon it, not only in English, but in French and German. No doubt, Mr. H. had read the various essays published in the horological papers at different times, including one by James F. Cole, "the prince of English watchmakers," on the *Isochronism of the Hair-spring*, which was republished in the CIRCULAR for 1876, Vol. VIII. This was expected to cap the climax in that line, but had lamentably failed to do so. Prominent English workmen had declared that it contained not a single new idea that would be any help whatever to the practical adjuster. There were also numerous essays read before various societies, or offered in competitions for prizes, etc. Some of these essays were valuable, while many of them advanced theories, to account for isochronal peculiarities, which were ingenious, but had no real practical value; and others were entirely unfounded and erroneous, and were calculated to lead the workman altogether astray. Considering himself to be well informed in the matter, he felt bound to say for Excelsior's book, that every publicly known method which was practically valuable, was to be found in its pages, besides others entirely new and original with the author. Each one was carefully examined, working instructions given, the particu-

lar cases to which it was applicable pointed out, its advantages and disadvantages described, and the whole subject brought out in a plain, practical manner that he thought had never been equalled by other writers upon it. Any one who has that work may rest assured that he has *the best* for the actual workman, and that careful study of its pages will lead to practical success. He would advise every fine workman to procure or make the conveniences for adjusting his best watches himself. They were not costly, nor difficult to use, and such work would be a pleasure to the skilful workman. By doing his own adjusting, he could also give more time than the professional adjuster could afford to on ordinary jobs, and perhaps suit himself better. If he had no taste or aptitude for such work, or lacked the time, this book would show him how to test his "adjusted" watches and see whether he got what he paid for. This was the reason why professional adjusters, who really understood their business, so readily endorsed the work for general circulation. They wish the trade to know how to detect pretenders, and thereby relieve the competent adjusters from their unworthy rivalry and competition, which is the cause of such slurs as that of A. V. R. being cast on the "professional class." We, as well as the rest of the trade, are interested in exposing and ousting the incompetents and humbugs.

Mr. I. also wished to say that there was an error or misprint in the report of his remarks last month, which made him say that the Club's opinion of this book can be found in our Proceedings in the CIRCULAR, for February, April and August, "1877." It should have been "1878." A synopsis of its contents is given in the CIRCULAR for September, 1877.

THE HOROLOGICAL SCHOOL IN NEW YORK.

Mr. Regulator explained that several letters on this subject were received and read last month, but as they were all based upon the supposition that Excelsior would be connected with the school, it was thought useless to publish them, after his note stating that it would be impossible for him to take any active part in giving instructions. A number of other correspondents had since written, under the same impression, and their letters will also be omitted for the same reason. Strange to say, not one suggests any different plan for starting the School. The members of the Club have been unable to think of any one else whose name and reputation would give the enterprise such good grounds for anticipating success, as it would have had with Excelsior at its head.

It seems highly probable, therefore, that the whole project will fall through, simply for the want of some leader whose name would inspire confidence, and incite general approval and effort in its behalf. This was to be regretted, for the need of such an institution was sorely felt, and the prospect of at last obtaining it had caused universal satisfaction and pleasure. No doubt, Excelsior would deplore this result as sincerely as any one. And no fault could be found with him for it, because he had shown us in his letter, just read before the Club, that his own business rendered it impossible for him to spare the time. We must, of course, acknowledge that a man owes a duty to himself as well as to the public. But perhaps some way could be devised to secure the influence of his name, with his counsel in the management, without drawing very heavily upon his time. We would again call upon our readers to think over the matter, and send us their suggestions, so that we may, if possible, yet get the enterprise into some practicable shape, either with Excelsior, or, if that cannot be done, then in any other way that will afford a reasonable hope of success.

USE OF OILING WIRE.—REMOVING WATCH JEWELS FROM THEIR SETTINGS.

Secretary of Horological Club:

"Excelsior" tells us (in his Treatise on the Balance Spring) how to make an oiling wire, and tell us to keep it very clean and free from dust, etc. I presume many of your readers are at a loss to know how to keep so small and delicate a tool where it will be safe, and where no dust or air can touch it. The following is my plan: I take a very small phial and fit a soft cork to it, letting it project a little outside. My oiling wire is made according to Excelsiors directions, and mounted in a wood handle about one-half inch in length, left square across at the lower end. I pass the oiling wire through the cork until the handle comes in contact with the cork, and fasten it with a drop of glue. We now have the the oiler in the bottle, with the handle outside and the cork stops the aperture, so that no dust or air can touch the oiler, and in fact it need never touch anything but the oil and the jewel. When wanted for use, it is only necessary to pull on the handle and out comes the cork and oiler. After using, it should be immediately replaced.

To remove valuable jewels from old plates, put a drop of nitric acid on the setting. This will soon eat away the metal and release them from their bondage, without the least danger of breaking.

M. A. M.

Mr. Uhrmacher observed that this would be a good way to keep the oiling wire clean, but it was also necessary to take care of the oil itself. If he remembered correctly, Excelsior directed that but little oil be put in the oil cup at once, and that the cup should be wiped out perfectly clean and dry, with tissue paper, every time more oil was wanted, to prevent any possibility of old or dirty oil mixing with the new supply, which would thus be perfectly fresh and clean. This could be done with the phial Mr. M. speaks of, if the mouth was as wide as the body, so that it could readily be swabbed out clean. It should also be small enough for two or three drops of oil to make say one-eighth of an inch deep. Then, by fastening it in some sort of holder or base, to prevent it tipping over when in use, and keep it down when the cork is removed, a very perfect arrangement would be made; and he presumed this was what Mr. M. had intended.

His way of removing jewels was well adapted for saving those in worthless plates, etc., while the method given some months ago was for cases where it was desirable not to injure the settings. The two methods would meet all cases.

WATCHMAKERS' TROUBLES, NO. 4.

Secretary of Horological Club:

I was much amused at the communication of "Reader," in the last number of the CIRCULAR, in which I find that others besides me were subjected to the same trials, annoyances and insults from some of our customers, and it will save me some trouble in writing to explain several of the troubles of watchmakers, which he states in his letter. This subject I will resume after I have given my views and opinions about Horological Schools. I perfectly agree with Mr. Horologer in all the advice which he gives to "Reader" about what to do with some of his customers, and I had intended to have given my own views on this question. But as he has done it so thoroughly and to the purpose, I thank him for saving me that trouble. I will now tell my plan of dealing with my customers. When one brings a watch to me to repair, etc., I examine it as much as practicable without taking it to pieces. If it is one that I have done before, and put in order within a reasonable time, I can easily tell if it has been badly used, or been in other hands to repair since done by me. I can easily see what the fault is, and if an oversight of myself or workmen, no charge is made. If the time of the warranty is passed, I tell him what the cost will be at once. But if it is a strange watch to me, or he has met with an accident and it is seriously injured, I get him to leave it, saying that I will take it to pieces, examine it thoroughly, and report the cost to put it in good order so that I can *warrant it.* If he does not wish to pay the price named, I return it to him as I received it, and by that there is no hard feelings between us, finding that in a great majority of cases, if it is really worth the expense of the repairs, he has it done. If a person dealing with me has not confidence enough to believe that I will do him justice, I do not desire his custom, and I frankly tell him so. By pursuing this plan and strictly adhering to it, I have retained many of my old customers from twenty-five to thirty years to whom I can refer at any time if desired.

Although I should be very much pleased and gratified to see Horological Schools established here, I am afraid that it will not be practicable to do it in this country until there is a complete change in the education and manners of the rising generation towards their elders. At this time you could get but very few that would subject themselves to serve an apprenticeship of several years to learn a trade; for I maintain that watchmaking cannot be learned properly in less than five or seven years. I served an apprenticeship of upwards of twelve years at the different branches of repeating works, escapements, finishing, examining, etc., in London, on the finest work. But when I came to this city I found that I was only a novice in repairing, and that there is every day something new to learn

Will the young men of to-day say the same? Not many, I think. As soon as they have learned to take a watch to pieces, and, perhaps, replace a piece—spring, screw, etc., and which can afterwards be obtained ready made, they brush it up, put it together again; and if it only ticks they think they know the business, and will not receive instructions from what they call "old fogie" notions of older and more experienced workmen, but start in business under the style of "Practical Watchmakers." As for paying for instruction, or giving part of their time to pay for it, that is out of the question, even if they never had a file or graver in their hands. I am not surprised that Mr. Sandoz, whom I know to be a very fine workman, did not suceed in his undertaking, although he was capable of teaching the business thoroughly. In my next I will give some of the experience I have had in taking apprentices, or young men who wished to improve themselves on fine work, etc. EXPERIENCE.

"THE PERFECTION SELF-FEEDING PEN HOLDERS."

The Secretary desired to return his sincere thanks for a suction desk holder of the above named style, presented to him by the manufacturer, A. H. Fowler, 148 William St., N. Y. The holder is of rubber, being hollow, and contains the supply of ink, which is delivered to the pen by the pressure of the fingers. The holder is elastic and compressible at the part held in the fingers. The harder the pressure, the greater the quantity of ink forced out. The supply is thus automatically regulated by the needs of the writer, and when not in use the ink is sucked back into the holder by the relaxation of the fingers. There is no machinery of any kind—nothing but the compressible holder, with the hole for the issue of the ink. An ordinary pen can be used with it. Altogether it was a very simple and ingenious contrivance, and would meet the wants of a large class who write considerably. Being relieved of the necessity of frequent dipping for ink, a writer could meet the longest-winded speaker without fear. As soon as he got used to it he predicted that there would be some tall reporting done here. He thought he should send word to the Adjuster-of-the-French-School to come back, as he was ready for him now, and could take down his wonderful lucubrations *verbatim, et literatim, et punctuatim, ad infinitum, et cetera, e pluribus unum, nix cumarous*, or any other man.

The Club then adjourned, leaving several letters till next month.

The Pneumatic Clock

AMONG the many wonderful pieces of mechanism to be seen at the Paris Exhibition, the pneumatic clocks exhibited in the Austrian section are not the least interesting. These clocks give exact time to all the clocks of a city simultaneously, whether the distance of the latter from them be six miles or sixty. The system has now been in operation for about two years in Vienna, where the time is sent in this way from the Imperial Observatory, through tubes laid along the gas mains in different parts of the city, to all the public clocks, the hands of which move by this arrangement at the same time. The city of Paris has recently authorized the "Societe de Horloges" to make a public trial of this pneumatic apparatus, with a view to the possible adoption of the system.

The principle upon which these clocks work is this: "If a column of air, inclosed in a tube at a given tension, be subjected to pressure, it immediately transmits that pressure to all its parts, even the most remote." But the compressed air, after having exerted its force, must be expelled from the tube and released by a fresh column; because, if the tube were not alternately opened and closed, this column would act precisely like an elastic spring; consequently the mechanical effect on the pistons would be insignificant, and the hands of the clock would remain at a standstill, powerless to move. The pneumatic clocks are at once simple and perfect; they are not likely to get out of order, and the escape of air, even, from the distributing pipes cannot alter the movement. This mechanism is extremely simple, and may be described as follows: Air is injected into a metallic cylindrical reservoir by means of a hydraulic motor; from thence this air is led into another large cylinder or distributor: it is only used, however, as fast and in such quantities as needed by the regulator. At every minute the air from the regulator enters the lead or iron distributing pipes, and acts on a leather piston inclosed in a small cylinder attached to a lever; and the latter determines the movement of an escapement that moves the hands of the receiving dial. This lever receives the pressure communicated by the central motor, and as every movement causes an escapement wheel to advance one notch, marking one minute of time. At every unlocking of the escapement wheel, the air from the distributor ceases communication with the distributing pipes, and escapes into the atmosphere. The regulator of the central motor is an endless chain clock as perfect as possible, furnished with a compensating pendulum. This receives astronomical time from the public observatory, and transmits it to the dials distributed in different quarters of the city, as well as to those of private dwellings. In order to prevent any accident, and as a simple measure of precaution, each central station is provided with twin motors, each complete in all its parts, and only one of which is in operation at a time. These two motors are connected automatically, in such a way that if, through an accident, the working machine suddenly stops, the other one at once begins operation, thus preventing the least retardation in the movement of the clocks. These clocks are so constructed that they must work perfectly or not at all; there is no alternative. The invention is due to Mayrhope, an Austrian engineer; but the merit of perfecting it belongs to M. Victor Popp, who during the last two years has attentively watched the working of these clocks at Vienna, correcting and modifying the apparatus day by day, until at length he has been able to present a system which is complete and perfect at every standpoint from which it may be regarded. As well known, the experiments made with the electric system have proved impracticable. Electric clocks are among the most unreliable of chronometers, electricity by its very nature being the most capricious of physical agents, and the intensity of the current varying with nature, species, and charge of the battery, and with the resistance of the conductors, media, exterior temperature, etc. However, by means of ingenious, complicated (and consequently very costly) mechanisms, certain very accurate electric clocks have been constructed, but their high price places them beyond the reach of any but the wealthiest institutions, and they are consequently unable to respond to a public demand. The invention of pneumatic clocks, then, appear to be of such real utility, and supplies such a pressing necessity, that we may expect to see them gradually adopted by all large cities.

Artificial Diamonds.

THE sons of the late Dr. Gannal, in looking over the documents left by their father, came across the draft of a paper which he had presented to the French Academy of Sciences in 1828, on the subject of the artificial production of the diamond. This paper was referred to MM. Vauquelin and Chevreul, and nothing further was ever heard of it. The MM. Gannal now send the document to the Academy, believing it to be their duty to bring to light the now forgotten researches of their father.

It seems that in making some experiments with carburet of sulphur, the idea occurred to Dr. Gannal that the carbon might be separated from it in crystalline form. He, therefore, took a certain quantity of the carburet, poured a little water on the top of it, and then carefully introduced some stick phosphorus. The latter immediately dissolved, with the formation of three separate layers, phosphorus at the bottom, carburet of sulphur in the middle, and water at the top. After a time he noticed that a sort of flim was formed between the two latter layers, and that when exposed to sunlight it was iridescent. After the experiment had been in progress three months, a sudden fall in the temperature froze the water, split the glass, and the contents were thus lost. He again began his experiments, but as each one required six months to carry out, and as the numerous accidents to which they were liable continually interfered with their success, he finally abandoned his efforts. However, in the course of his experiments he had been able to procure some minute crystals, which he submitted to an eminent jeweler, who tested them by the microscope and other means, and decided that they had the true fire, water and hardness of the diamond; moreover, on being subjected to the blowpipe, they left no ash.

The Flat and the Curved Hair-spring.

AT one of the last meetings of the Section of Horology at the Atheneum, Mr. Phillippe read an interesting article on the simple flat hair-spring, compared with the curved hair-spring, rendering very favorable judgment to the former, founded on several years of attentive varied observations. This result cannot be denied.

It is evident, and all adjusters, I believe, know by experience, that it is just as easy to regulate the running from laying to hanging positions with a flat hair-spring as with a curved one; it is sometimes even easier. The reason is because the flat hair-spring allows an easier search of points of attachment more favorable to isochronism; for, as it is not limited by a curve on its outside coil, it allows a greater latitude to find the best fixing point to the loop. Thus it gives the adjuster the double advantage of being able to modifo the attachments, either at the exterior or in the center according to the case; while for a curved hair-spring the exterior point of attachment is nearly always determined by the curve, there remaining only the central coil by which to find the point looked for. It is true that the curved hair-spring is the most efficient and, with a strictly theoretical curve, has better isochronal qualities, giving at once, in most cases, in laying and hanging position, running more satisfactory than its competitor; but if we will give a closer adjustment in utilizing the resources above mentioned, we are sometimes astonished at the facility with which we can reduce the deviation, often inconsiderable, made at first by the flat hair-spring. We should remark on this subject, that the side pressure produced on the pivots of the balance-wheel by the running of the latter hair-spring, works in a nearly equal way in all positions, and does not take away the possibility of reaching a relative isochronism.

However, in spite of this, I still share the prejudice that M. Philippe wishes to combat; for, after all, a good watch is not made to go well for two or three months only, but at least two years before changing the oil. It is, therefore, in the constancy of the running during that time, and even during a longer time, that a hair spring shows its true qualities. It seems to me that this important point was not taken up, and M. Philippe himself declared that he had not been able to make that experiment, which is precisely the only con lusive one.

What does a chronometer require to preserve its regular rate for a long time? Its balance-wheel must be as free as possible; this is obtained principally by the means of a hair-spring, whose action is the most concentric to the axle in all its degrees, exercising, consequently, the least side pressure in the pivot holes. This can much easier be obtained by a curved hair-spring than a flat one—everyone agrees with me on this point. Besides, we can be convinced every day, all the chances being equal, that the watches with flat hair-springs have a shorter balance wheel motion (consequently less free), than those having curved hair-springs, and that they lose it sooner. I recently had a striking example of it with three anchor pieces, perfectly identical, which I had to regulate. One of them, with a curved hair-spring, presented a very superior motion, as compared with the other two, which had flat hair-springs. It often happens that in watches with curved hair-springs we have to change the mainspring and put in a weaker one in order to avoid the overbanking of the balance wheel.

An evidence of greater freedom for the balance wheel, with a curved hair-spring, was furnished me by having had several watches to repair where a balance wheel pivot was completely worn out, either by the oil having been forgotten, or being of bad quality, or an insufficient quantity put in. Nevertheless the watch had continued to run for a long time, until the pivot, being more and more worn out, producing a slime or blackish powder, and finally became broken, which forced the balance wheel to stop. One of these watches had been running for four or five years in succession before the accident occurred (it was waiting too long before being cleaned). I do not remember of having noticed such an occurrence with a flat hair-spring, for it is very probable that a watch in this condition would stop before the wear had so far advanced; the balance wheel would also sooner lose its free action. In spite of that the evil produced in the latter case may necessitate a repair quite as considerable as of the first example, which would not be a profit. Of course, such accidents do not happen with oil of good quality, applied with care.

Now, in order to come to a truly practical study on the comparative merits of the several hair springs, and to put an end to those everlasting discussions on the subject, especially as regards the constancy of the adjusting, would it not be possible to arrive at a positive knowledge, which the Bureau of the Section of Horology might undertake with the help of the class? For instance, in constructing twelve anchor watches of the same size, perfectly equal in respect to movements, escapements, balance-wheels, etc., having the same oil, the only difference being in the hair-spring, which would be curved for six movements and flat for the others; they should be adjusted by two or more adjusters, according to their preference for one or the other kind of hair-spring, in order that emulation would guarantee careful work. The pieces being finished, they would be put together in the Observatory for two years, to be submitted, from the beginning, to the trial of the first class according to rule; then, after the trial, the astronomer would simply wind them up every day, without making any comparison, until the expiration of one year; after that time they should undergo a new trial as in the beginning. A report of this second trial should be made and compared with the first, then the watches should be simply wound up every day for another year, at the end of which a last trial should be made, the same as the two preceding ones. At the end of these two years the watches could be withdrawn and a comparative report made of the result of the three trials.

I am persuaded that such an experiment would be of great interest on account of its instructive and positive results, since these would be based upon the conformity of the conditions to which the twelve watches would have been submitted, and upon the impartial exactitude of the observations. To give to these trials a greater value, it is to be desired that the hair-springs used, flat or curved, should be made of the same steel and be of the same temper, in order to add one more guarantee to this rigorous equality of conditions, in which all these movements should run, for it is well demonstrated that the degree of temper a hair-spring, acting on its elastic properties, can modify, with the time, the running of a chronometer. Prof. Thury has already explained this in the interesting lectures he delivered a few years ago, ascertaining that the elasticity of untempered steel is weakened by constant work, while, on the contrary, the elasticity of the tempered steel increases by the same work. It is this that partly explains the acceleration of many chronometers with cylindrical or spherical hair-springs, which, after having been perfectly regulated, run from ten to twelve seconds fast per day, after two or three years, although the oil has been changed. Therefore, if we could also add two or three watches, with cylindrical hair-springs, to this new test of regulating it would make it more conclusive.

As to the expenses occasioned by this competition, they would perhaps not be very great: *first*, the movements would probably not lose any of their value during these two years, they would gain according to the results obtained. Of course there would be the loss on the interest of the capital employed, but we may reduce it by setting the movements in temporary cases, in copper for instance, as they do the regulating of certain American watches. It would be well if the movements were simply set up in the rough, in order to leave the finishing brighter at the moment when they enter into commerce. It would be very easy to settle all these details if the idea was taken into consideration. We live in a time when the industrial progress is facilitated by all kinds of competitions and expositions. To away from hypotheses, we must absolutely have facts based on practical experience, and what I propose has never been done, yet, nevertheless, I am convinced that it would add success to that which theory demonstrates as giving the best results.

In concluding this statement, I must say that M. Philippe did well in again calling attention to the advantages of the flat hair-spring, for we have certainly gone to excess in regard to the curved one, in using it in all kinds of anchor watches, even in the most common ones, instead of reserving it for watches of better quality; as it is, the most common watches run the greater risk in falling into the hands of unskillful repairers; they are often returned in a worse and more defective running condition if they have a curved hair-spring than if they had a flat one—the latter is always easier to put in good order.—*Journal Suisse d'Horlogerie.* E. P.

Practical Hints on Watch Repairing.

By Excelsior.—No. 43.

EXAMINING THE DETACHED LEVER OR "ANKER" TRAIN.—CONTINUED.

(668) *The Main Wheel* and the mainspring box or barrel are generally in one piece, with a cover springing into one end of the barrel. There are several other parts connected with them, about which there is considerable to be said, as the winding arbor, the mainspring, the stop works, the ratchet and click, etc. For convenience, each will be considered separately. If the main wheel is not round or concentric with the central hole, or the hole is worn too large, or the wheel does not run truly, *i. e.*, one side tips up and the other down, or the wheel is tight at its center, these may be considered faults of the barrel, which see. If the main wheel rubs up under its bridge, and is correct otherwise, that should be turned off to clear it. If it rubs against the sides of its bridge, which sometimes happens, they should be turned out larger. If the points of the screws which hold the ratchet wheel cover or bar, or the click, stick through and rub on the main wheel, the ends should be dressed off level with the under surface of the bridge. If the point of the click (whether a loose or a spring click) runs so low as to rub, and is held up tightly and properly in its place, the under surface must be taken off enough to clear the wheel. If too hard to file conveniently, it should not be softened, but ground or stoned off.

(669) If the spring part of a spring click rubs on the top of the wheel, and the latter is level and correct, the edge of the former must be filed away enough to clear. Also look if the foot of the spring click, or click spring, can touch the points of the teeth, either in the front or rear part of the edge. Sometimes the bridge screws are set so far from the ends of the bridge, that they come through into the inside and touch the teeth, or the brass around the screw holes may be forced in and do so. Examine both the heads and the body or threads of the screws for this fault. If the brass touches the teeth, that can be removed; but if it is the head or the threads that touch, run the screw in firmly as it should be, then mark the side towards the center of the bridge, take it out again, and dress off that side to clear. Of course, care should be taken not to change such screws, but return each to its own hole.

(670) If the main wheel teeth are bent, straighten them up from both the upper and lower sides of the wheel, (660). If the front corners of the teeth are worn, it indicates a too shallow depthing in the center pinion. The faces of the teeth must be dressed off to get out the notches, (659,) and the wheel set up towards the center pinion to remedy the scant depthing. The way to do this depends on the circumstances: if the hole in the center of the main wheel is worn, that would let the wheel get away from the center pinion, and the hole should be repaired. (See Spring Barrel.) If the hole in the bridge, where the barrel arbor goes through, is worn, that also would let the arbor and wheel away from the pinion, and the hole should be closed up or bushed so as to bring the arbor and wheel up to their places. If neither of these holes is worn, the depthing has probably always been too shallow, and the entire bridge should be moved towards the center pinions. The steady pins are first altered, (628). It may then be necessary to file back the holes in the bridge for the bodies of the screws, also to cut out the seats for the screw heads, either in the lathe or with the freeing tools, else the screws will not go in after the bridge is moved up. In a fine job, these seats should be kept round, which will make them larger, and new screws should be fitted, having heads large enough to fill them. When the lower end of the barrel arbor is supported in a cross bar, the pivot hole in that must also be filed forward and closed up from behind to keep the main wheel level. But in many cases, when the ratchet wheel does not fill its sink, and the central part of the bridge is thick and stout, the hole through the bridge can be filed forward and closed from behind to fit the arbor bearing snugly, thus moving the arbor and wheel instead of the entire bridge. When so done, the action of the ratchet and click must be looked to afterwards, and if it has been disturbed it must be made to operate properly again. If much too shallow, it would be better to move the bridge instead, as before described.

(671) If the back corners of the teeth are found bright, they should be dressed off a little, making the teeth thinner. If the points of the teeth are blunted and flattened by touching in the bottoms of the spaces between the pinion leaves, the depthing is probably too deep and may be corrected in the reverse way to that just described for making the depthing deeper. If the butting is caused by the pinion leaves being too short, while the depthing is correct, not often the case,) the points may be turned off a little and shaped up again less pointed than before. If the teeth rub on the plate of the movement, and their position is correct for the other parts and should not be raised, a groove can be turned in the plate, around the edge of the sink of the barrel, to clear the teeth. If they touch on the edge of the center wheel bridge, that should be dressed off. If they stand so high that they rub up against the center of the center wheel, in the pinion, the main wheel should ordinarily be lowered. Workmen sometimes remedy this fault, in solid ratchet arbor, by inclining the main wheel bridge over so as to throw the inner side of the wheel lower in the center pinion, by raising burs under the outer edge of the bridge. But, although this is a quick and easy way to alter the height of the wheel in the pinion, it should be very seldom allowed, and then only for very slight alterations, as it makes the teeth act obliquely on the pinion leaves, so that only a small surface is in use causing liability to soon wear out of shape, makes the depthing a little deeper, and gives an unsteady support for the bridge, and one which, if unskillfully placed, will disturb the shape of the bridge and the height of the barrel by screwing tight—throwing the center up or down. The proper way to raise or lower the main wheel is to alter the barrel, as hereafter described.

(672) If the main wheel is tight, and has no end shake at all on the arbor, first see whether it is tight between the arbor nut or center and the bridge, or between the nut and the upper arbor shoulder, or the whole barrel is tight on the nut and don't touch the bridge or the upper shoulder. In the first case the upper arbor shoulder is too short, and, if allowable, the ratchet wheel sink should be turned a little deeper, which will make the shoulder project below the bridge, and hold the barrel out of contact. If it is not permissible to do this, on account of lowering the barrel, the under surface of the bridge must be removed, at the center, till it clears the barrel. In the second case, we can turn off either the arbor shoulder, or the hub or boss around the barrel pivot hole, according as we wish the barrel to stand a little higher or lower respectively. If its position is correct we can alter both shoulder and hub a little, which will give freedom and keep the barrel at the same height as before. In the third case, see that the mainspring coils are true, the arbor hook in the center, etc. The barrel is then freed by turning off the upper or lower hub inside, according as we want to lower or raise the barrel, or by turning off both, when the barrel is right. We may also free the barrel by springing the hubs out a little.

(673) *The Spring Barrel.*—If the sides of the barrel reach against the walls of its sink through the plate, cut out the sink where the rubbing takes place. Sometimes the barrel hook sticks out a little and rubs. If so, the mark can generally be seen around the sink, or wherever it rubs. If the hook is loose, a new one should be fitted, instead of trying to rivet or solder the old one. The best way is to put in a steel screw that fits the hole tightly, or file the point three-cornered, like a tap, and cut a thread in the hole. Then file off the point, and shape up the hook properly, on the end of the screw, taking care not to injure the threads except on the part actually used for the hook, then run the screw into the barrel till the hook projects inside the right amount, (and points in the right direction), cut it off on the outside and finish up level with the outside of the barrel, being careful not to file or mar the gilding. This makes a strong and durable hook, and one that will stay in, without soldering or riveting. A

brass screw can be used instead of a steel one, in the same way.

(674) If the lower end of the barrel rubs on the cross bar, around the center, we can raise the barrel on its arbor, or, if there is plenty of room for hight, we can raise the bushing in the cross bar, or put in a thicker one, to hold the lower end of the barrel arbor up higher. If the barrel has too much end shake on the arbor, the rubbing can be cured by springing the upper hub down, thus at the same time correcting the end shake and raising the barrel to clear the cross bar. If the edges of barrel rub, and the end shake on the arbor is correct, the cross bar may be filed or turned off near its ends, if thick; if thin, the ends may be lowered to clear the barrel, while the center is sprung up, to hold the arbor up in the same position as before. If the heads of the screws that hold the bar come through and touch the edges of the barrel, they must be dressed off to clear, (669). If the stop works, or their screw, should rub on the bar in passing over it, and the end shake on the arbor is correct, either spring up the center of the bar and lower the ends, to clear, or put in a thicker bushing, to raise the arbor, as above described. The terms "up," "down," etc., are to be understood in these directions as they would be when looking at the movement with dial underneath. When looking with dial side up allowance must be made for this. The motion wheels, however, as they can only be seen with dial side up, are described as they would be when so seen. With these exceptions, "down" means towards the dial, and *vice versa*.

(675) To raise the barrel (on the arbor), when the arbor center or nut screws on, we take off the nut and countersink the upper side, at center, so that it can screw further up on the arbor. To raise the barrel together with the arbor, see Barrel Arbor. When the nut is pinned on, thin the hub at the lower end of the barrel, if necessary to let the barrel up, and put a thin washer between the nut and the upper hub, to keep the barrel up. Or, for slight alterations, the two hubs can be raised or lowered, as required, by "bumping" or driving with the hammer and punch; resting the piece on a stake whose hole just takes in the hub, so that only the hub shall be sprung up or down, else the central coils of the mainspring will rub on the barrel end Should the above springing take the hook out of center, so that the inner end of the mainspring scrapes,widen the hook hole in the spring, either up or down, as needed. Some workmen spring the whole head or end of the barrel, to raise or lower the hubs as described. This makes one end of the barrel slightly conical, and the other like a hollow cone, and every coil of the spring will rub on one end or the other, in winding or unwinding. But the ends of the barrel should be flat to secure an easy action of the spring. To lower the barrel, reverse the above. It can also be lowered by turning out the bridge to let the ratchet wheel set lower, as already described, when we have a solid ratchet arbor.

(676) If the ratchet is loose on the arbor, we can raise or lower the barrel by raising or lowering the arbor, by altering the arbor shoulders, or the bushes of the bridge and the cross bar, as well as in the way described in the preceding section. If the barrel has no nd shake on the arbor, we can free it by turning off either the upper or lower side of the nut, according as it may be desirable to have the barrel stand lower or higher than before, or, we turn both off a little, when the barrel stands about right. If the barrel has too much end shake on the arbor, the hubs may be "bumped" nearer together, as in section (675). If too little, find whether the nut is tight between the two hubs, or the upper hub is tight between the nut and the arbor shoulder just outside of the barrel, or the lower hub tight between the nut and the male stop wheel. In the first case, we proceed as above described for "no end shake." In the second, turn off the upper hub, or turn back the arbor shoulder a little higher, according as the barrel should stand lower or higher. In the third case, if the male stop wheel does not stand level, or its under surface is rough, or it has a feather edge around it, smooth and correct it as needed; or give the end of the arbor a tap with the hammer which will often alter the pin of the stop, enough to let the stop up and free the barrel. If the stop and its pin are correct, we must turn off the lower hub or the lower side of the nut a little, when the nut is pinned on or solid; if it screws on, the upper surface may be countersunk a little to let it turn a little further up, and so free the lower hub. The nut, when pinned on, should have a hard steel pin, well fitted, the ends just flush with the sides of the nut.

(677) If the barrel does not run truly, but one side up and the other down, change the position of the cover or head till true, then mark the place. The notch in the edge of the cover should correspond with the dot in the side of the barrel. But if the barrel is not true when so placed, and you cannot change the position of the cover as above, so that it will be true, find where it is when it turns the nearest true, and make a new dot in the edge of the barrel, opposite the notch. Then take out the cover, and file a little off the edge that is on the side of the barrel which sticks up the highest, when you hold the arbor horizontally in the sliding tongs and let the barrel turn on it. Do this till you can wind up the spring, and then, holding the arbor still, let the barrel turn slowly in your fingers, without seeing any wobbling. If this makes the cover loose, you must stretch the opposite side. Place it flat on the anvil, with a piece of tissue paper under it, and hammer gently around the scant side, being careful to keep it perfectly flat, and not warp or "wrinkle" it. Of course the cover edge must be a trifle smaller on the outside than on the inside, in order to stay well when sprung into its groove. The interior of the barrel must be free from any roughness, projecting screw points, or burs around the edge of the notch, and perfectly smooth and level from the sides to the center, on both ends. If not so, it must be turned out or otherwise made so.

(678) If the pivot holes were a little too large for the arbor pivots, or bearings, that would cause a part or the whole of the want of truth, and they should be closed up with the closing punch, or, if the hole is worn one-sided, with the half round punch. These tools should be rather sharp or acute-angled for this use, and should be so used as to move the entire side of the hole, and not merely a little metal at the outside edges, as this would soon wear down under the pressure of use, and soon be as bad as ever, or even worse. It is well to close the hole a little too small, then smooth out with the round broach, well oiled, which will both enlarge the hole to the proper size and also harden the bearing surface. Then level off any burs around the edges. Do not place the closing punch too far from the hole, or you will only enlarge the outside of the hub, instead of closing the hole. Before doing this, the bearings or pivots of the arbor should have been found to be smooth, properly shaped and well polished, or made so.

(679) If the holes need considerable closing, it is much better to plug them up with hard brass, and turn out new and perfect holes to fit the arbor. First chamfer the ends of the old holes a little, fit the plug in firmly, with the end just a trifle more than level with the surface, so that a very little hammering will make it level and fasten it securely. Put up the main wheel in the lathe, centering it by the points of the teeth, and cut the pivot hole for the arbor. Then, having plugged up the hole in the cover in the same way, if worn, spring it into its place in the barrel, and cut that hole, which will of course be uprighted from the other, and the whole barrel will be true. Both sides of the cover bush may be smoothed off while in the lathe, by springing it into the barrel with the desired side out. The holes, as before remarked, (678,) should be left a trifle small, and burnished out to size with the round broach. In case the bush, when finished, would be too thin to be substantial, when put in as above directed, the old holes can first be reamed out larger, to take a larger plug.

(680) *The Mainspring* and its fitting. The nut on the arbor should be one-third the diameter of the barrel cover. The mainspring, when in the barrel, should occupy half of the remaining space, or reach half way from the side of the barrel to the nut, exclusive of the central coil around the nut. If it occupies more space than that, it is too long. Break off the outer end, soften and make a new hook hole. If the spring don't make the necessary number of turns, this shortening will also increase them. When wound up, without the

stop works, the arbor should have about five turns. If more than that, it is still better; if a little less, it may do; but if the arbor makes less than four and one-half turns, from one extreme of the winding to the other, it is not well fitted. It may be too long or too short, too wide for the barrel, too low-tempered and soft, not level in the coils, the hooks or hook holes not properly made, etc.,—supposing, of course, that the barrel is properly free on the arbor, when tested without the spring in it, and otherwise correct as already described in the last part of section (677). If the spring, in unwinding, pulls the arbor back the same number of turns that it took in winding, from perfect freedom to entirely wound up, the trouble may be in the improper length or temper of the spr ng. But the unwinding often falls short of the winding by a quarter or half turn, or even more. In this case, the trouble is one of the other faults enumerated above, or it may be gummed up with poor or old and sticky oil.

(681) The proper length is described in the preceding section. If the spring is too soft, there will be two to four coils, more or less open, around the nut, instead of the entire spring pressing outward and lying compactly together (except about one coil at the center), as should be the case. If, notwithstanding this, the spring still gives four and one-half to five turns to the arbor, it may do for a while,—otherwise it should be replaced. When the nut is rather small, or the center of the spring was evidently made for a larger nut, if the spring is high tempered, it will be advisable to draw the temper of the central coil or two, or the cramping of it around a nut smaller than it was hardened for may cause it to snap off soon. If a new spring, it may break the first time it is wound up. Have the flame of the alcohol lamp no larger than a pea, then carefully heat the spring, beginning at the center, where the temper may be taken out to a gray or light blue for the first coil, thence gradually changing from that to the color of the rest of the spring. It will be sufficient to thus soften two or two and a half coils. In a fine watch, however, a spring should be obtained which will be correct without this softening.

(682) In width, the spring should reach no higher than just to the groove in the barrel for the cover, even when the cover is slightly raised by a ridge around its edge. If the cover has no such ridge, but is level to the edge, the spring should of course be slightly narrower, or fall a trifle short of the groove. If the spring is a little tight in the barrel, either end can be turned out a little. If the cover is to be turned, it can be mounted on an arbor, a chuck in the lathe or the barrel can be mounted in the lathe, and the cover sprung into the end, in proper position, (677), with its inner side out, and then turned off, with the exception of a slight ridge around the outer edge, where it fits the groove. If that is turned off, the space in the barrel will be no wider than before. While in the lathe, if the hubs around the barrel pivot holes are too much spread, so that they interfere with the central coil of the spring, turn them down a little smaller. If the spring is much too wide, and tight in the barrel, a narrower one should be fitted.

(683) In trying the spring in the barrel, wind the arbor entirely up (holding it in the sliding tongs), see if the barrel has end-shake, also wind the arbor up and down a quarter turn, a number of times to see if there is any scraping or binding in the barrel. Try this wiggling of the arbor frequently as you let the spring slowly down; also see if it has end shake in all positions. If there is any rubbing, or the spring gives one or more "jumps" as it unwinds, it must be looked to. If there is rubbing or tightness when wound entirely up, the central hook or hook hole may not be in the center of the barrel, and so press the end of the spring up or down, and against one end of the barrel. If there is rubbing or jumping as the spring is let down, the coils may not be level and true, or the spring too wide, (682), or the inside of the barrel not smooth and free, (677). If the arbor hook is not in the center of the inside space, and cannot conveniently be altered, the hole in the spring must be widened till it will rest freely between the ends of the barrel, when on the hook. When the spring is held free in the hand (out of the barrel), the coils should be in the same level from the outside to the extreme inner end. If not so, spring it wherever necessary, till the whole is true in the flat.

(684) The central end of the spring should be so curved as to rest closely against the nut, so that by turning the arbor the hook will spring into the hole and fit securely. The softened outer end should be bent to the outline of the barrel. The formation of the hook hole is of some importance. Many workmen make the hole some distance from the end of the spring, the end, back of the hole, being tapered down nearly to a point. Such an arrangement is correct when the hook is fastened in the spring, as in the English lever, but, when the hook is attached to the barrel, there should be no tail behind it. The only effect it has is injurious, as it causes a bending of the spring at the hook hole every time it is wound, with a very strong tendency to raise the spring off the hook before bending. The proper shape is a round hole, with the holding edge properly chamfered off inside, to take well into the hook; the end of the spring rounded, with the metal no wider back of the hook than above and below it, and the back end chamfered from the outside, *i. e.*, about parallel with the hooking side of the hole The object of this is that, when the spring is wound up, the end will be able to swing back on the hook as a fulcrum, and pull in a straight line, without pressing against the side of the barrel and springing or bending the metal. If well made, there will very rarely be any slipping off the hook, or breaking at the hole.

(685) Something more may be said on the fitting of the mainspring, testing with the adjusting rod, etc., in the article on Springing. In putting the barrel together, both barrel pivots, and both shoulders of the arbor nut should be oiled, and the spring itself should be well oiled from end to end,—not enough to have loose oil standing anywhere, but so that every part should be lubricated. Do not put new oil with old, thick and gummy oil, but first clean off the spring and interior of the barrel by soaking in pure alcohol, then brushing off any adherent dirt, and oiling again as soon as the alcohol is dried off. The practice of wiping off mainsprings with a rag is very objectionable, as they are sure to be badly strained, and often straightened out, bent or twisted, so as to be much more liable to break than if let alone. Soaking loosely in alcohol does not strain it, and gets it thoroughly clean, which wiping can never do. It should not be soaked in benzine, unless it is perfectly pure. Common benzine will not entirely evaporate from the spring for hours, or even days, as shown by the smell. And any trace of it, left on, will injure or destroy the value of the oil as a lubricant. Before using benzine, soak some smooth metal piece in it, wipe off dry, and if you can smell it at all after standing five minutes, it should be rejected as unfit for the watch bench. Pure benzine has its uses, when the parts are cemented together, (279), but in all other cases alcohol is as good, and is also free from the above objections.

The Original Master Humphrey's Clock.

THE famous timepiece of fiction, the original and authentic "Master Humphrey's Clock," immortalized by the pen of Charles Dickens, has been for several days past at the horologe establishment of Mr. George N. Joyce, corner of Fulton and Water streets, this city. It has been undergoing repairs in the most practical and unromantic manner imaginable, and hundreds of the curious flock daily to view the antique reiic. Lovers of the writings of Charles Dickens must be peculiarly interested in this quaint memento of the great novelist. It has a history which dates far back of the earliest buddings of genius of the author of "Old Curiosity Shop," and it became an old and favorite acquaintance of his long before that book was ever written. "Master Humphrey's Clock" belonged to a venerable horologist of that name, living in the year 1840 at Barnard Castle, County of Durham, England. Mr. Humphrey had his shop in the market place, and the clock used to stand in a conspicuous place in front of the shop. It was on the big thoroughfare of the little village, and the villagers often went out of their way to get a glimpse of its kindly visage, and learn the time of day. The coun-

try folk coming to the market place with their produce, used to gaze upon the big open faced dial with awe and veneration, and, it is said, some of them even went so far as to believe that the old clock regulated the sun. But, if this is true, they were over credulous, for we are not aware of any historical record where any one has had the temerity to interfere with the tergiversations of that luminary since the time of that doughty warrior, Joshus.

Across the way from Mr. Humphrey's modest establishment was an old-fashioned inn, called "Boar's Head." At this place of refreshment Dickens made his headquarters in the year 1838, when he came down to Barnard Castle to collect materials for his contemplated novel, "Nicholas Nickleby." It was there his fancy conjured up the ideas that were subsequently elaborated in his chapter on the Yorkshire schools. And it is history that the novelist was very materially aided in collecting his facts through the assistance of Mr. Humphrey Dickens used to sit in his room at the tavern over the way, and gaze out of his window at the big clock staring up at him from its position in front of the watchmaker's shop. On the face of the clock the name Humphrey was painted in large gilt letters. Before Dickens had taken up his quarters at The Boar's Head a fortnight, the odd looking clock was the means of his becoming acquainted with its owner. On the pretext of inquiring into the pedigree of the timepiece Dickens went over one morning and introduced himself informally to Mr. Humphrey. The latter and he soon became warm friends, and it is to the old clockmaker that Dickens owes some of his brightest pictures in his description of the Yorkshire schools. He sent the author of "Nicholas Nickleby" to a dozen neighboring boarding schools, and among them to the school of the identical old scallawag Squeers and his promising daughter, Miss Fanny. On this occasion the illustrator "Phiz" (H. K. Browne) accompanied Dickens, and while the interview lasted the enterprising artist sketched the simpering Miss Fanny and her devoted parent on his thumb nail and carrying away a vivid impression of the precious pair and reproducing them with such graphic fidelity in Nickleby the year following that Squeers didn't have a corporal's guard at his school the next term, and, as we all know, going up to London soon afterward and suing the famous novelist for libelous publication. It was some time after Dickens' visit to Barnard Castle that the project of a three-pence weekly periodical occurred to him. He fixed upon the name of "Master Humphrey's Clock" as the title for his new publication. In April, 1840, the first number was issued. The plan of the work was intended to be after the style of the *Spectator*, the *Tattler*, or Goldsmith's *Bee*. It was to consist principally of detached papers, but was to include one continuous story. This story afterward, with certain alterations, appeared in book form of the "Old Curiosity Shop." "Barnaby Rudge" also appeared in "Master Humphrey's Clock," which ran two years, and included eighty-eight numbers.

The story of "Master Humphrey's Clock," described an old gentlemen of that name who started a club which met weekly at his house, a delapitated dwelling situated in a venerable suburb of London. In the room in which the club met, in a snug corner by the blazing embers dancing over its sobre disc, stood a quaint old fashioned clock in a huge oaken case, curiously carved in fantastic designs. In the bottom of the closet, dark and deep, while the massive weights swang heavily to and fro, the members of the club at times deposited tales of their own contriving, which were taken out at their august meetings and read. Dickens too, it is said, liked to imagine the old man sitting alone long evenings, having no companionship but the queer old clock, for which he by and by got an affection. The tones of its voice, as it tolled out the hours of the day and night, grew to be music to the old man's ears, and the dusty face after a while became that of his most familiar friend.

This same old clock, over which Dickens spent so many hours musing, is now the property of Mr. Isaac H. Bailey, the editor and proprietor of the *Shoe and Leather Reporter*. It was presented to him in 1876 by Messrs. George Angus & Co., leather importers of Liverpool. In 1840 the clock still stood in front of Mr. Humphrey's shop in Barnard Castle. The family of Mr. Humphrey, who is now long deceased, have now in their possession an autograph letter from Charles Dickens to the effect that he christened his book after the old clock, and also a copy of the work inscribed in his own hand. Mr. Richmond, a London jeweler, purchased Master Humphrey's clock at the sale of the old Barnard Castle horologist's effects, and afterwards offered it to the Central Exhibition Art Gallery, at Newcastle-on-the-Tyne. They purchased it from him, and subsequently disposed of it to Messrs. Angus & Co., after the latter made a thorough investigation in the premises, and assured themselves of the authenticity of the clock. Only the works are at Mr. Joyce's for repairs. The face and case are at the *Shoe and Leather Reporter's* office, on Spruce street. The face is large and circular, colored black, with figures that once doubtless were white, but now are weather beaten and yellow with age, or rather time. The case is about five feet high, and is newly painted. A massive pendulum, weighing eighteen pounds, hangs in idleness in stout catgut strings four feet below the drum on which the catgut is reeled as the clock is wound up or runs down. The works do not materially differ from other works except that their construction is rather primitive and plain. The hands are long and spreading. The works are protected by two large brass plates, five inches long by four inches wide. On the front is the hour wheel, directly under the hands, the two minute wheels close together, and one common pinion which sustains the minute hand. There is a crude looking winding post at the back, and a counter balance for the minute hand shaped like a pear and made of lead. There is also a funny looking thing with an elbow, called the crutch, for the pendulum to balance on. On the inside the works are the same as in ordinary clocks. In appearance the whole affair has nothing really remarkable about it—the most interesting thing connected with it being its associations and the prominent position it occupies in modern fiction.

The French Watch and Clock Trade in 1867 and 1878.

MONS. CLAUDIUS SAUNIER, in the *Revue Chronometrique*, makes an interesting comparison between the state of trade in these branches at the time of the last and the present Exhibition. He estimates that France manufactures *heavy* clock work, such as turret clocks, etc., to the amount of £100,000 a year, an increase of £20,000 on the production of 1867. Mons. Saunier claims that French public clocks are superior to those made in any other country, excelling not only in perfect workmanship, but also in judicious mechanical combinations. This branch of the trade is not confined to any particular town or department, about fifty manufacturers being established in various parts of France, many of them, however, only on a small scale; and the lion's share of the business falls to a small number of Parisian and two or three provincial firms.

The centre for the manufacture of *medium* clock work, such as Comté clocks, turnspits, and ordinary regulators, is the canton of Morez. The town of that name, with 5,000 inhabitants, does a very brisk business in this line, employing about 6,000 hands living in the neighborhood, besides a large number of its own population. These Comté clocks are said to be superior to the Black Forest productions, and 100,000 of them were turned out in 1867, representing a sum of 4,000,000 francs. The annual production of Morez is now stated to be 70,000 Comté clocks, 30,000 turnspits, and 20,000 pendules, part of the latter being traveling clocks. We have, therefore, a falling off in the clock business, a loss which is, however, more than made up by the addition of the pendule branch. Some of the leading firms of this town sell also watches, which they draw principally from Besancon.

French clocks (pendules) to day, as in 1867, are a combination of different elements, manufactured in various parts of France. Beaucourt-Badevel, Montbéliard, a few localities in the Jura, and Saint Nicholas d'Aliermont, near Dieppe, construct the movements called *blanc-roulants*, or simply *roulants*, that is, the frame of the movement with its wheelwork, Some of these movements are provided with an escapement, finished and placed in cases either at Beaucourt or at

Morez, others are sent abroad in their unfinished state, but the greatest number find their way to Paris. There they are supplied with escapement, dial, hands, etc., finished off, fixed in cases, which Parisians politely call cabinets, in wood, bronze or brass, and then redispatched to all parts of the world. The cylinder, anchor escapements, etc., with circular balance, employed in portable clocks, are drawn from the neighborhood of Montbéliard, Morteau, and the watchmaking districts adjoining Switzerland, while the escapements adjusting to pendulum or rectilinear balance, by far the most numerous, are manufactured in Paris.

According to some figures which were submitted to the members of the Jury, in 1867, the factories of Beaucourt-Badeval (Japy fréres) of Montbéliard (Roux & Cie., Marty & Cie.), and of Berne-Selencourt (Louis Japy), turned out about 150,000 clock movements in 1856, the work of 2,000 to 2,500 hands, and representing a value of 2,000,000 francs. This large production, at such a comparative small cost and labor, is principally due to the employment of machinery. Mons. Monnin-Japy, in a communication to Dr. Muston, of Paris, in 1857, states that Paris alone had bought 140,000 of these movements, and that the remaining 30,000 were sent abroad rough, or finished or mounted in the establishments of the Doubs and Jura. It is reported that this branch of clock making has since been transplanted to the Departement du Doubs, where the manufacture of clock movements, especially for traveling clocks, has assumed large proportions, and the official catalogue of the Exhibition of 1867 estimates the annual production of movements of the Upper Rhine and Doubs at 200,000. Montbéliard exported in 1867, in addition to the numerous quantity of movements, about 30,000 musical boxes, of which one-third went to England and America, one-third to Germany and Russia, and the rest to other parts of the globe. The leading establishment in this line is at Saint Suzanne, near Montbéliard, founded by Mons. Lépée. In 1878 the factories of Montbéliard have still further extended, the actual production being 400,000 movements for clocks, telegraph apparatus, and gauges of all kinds. In this estimate are included the small, completely finished and superior clocks, brought into the market by Messrs. Japy frétes with a view of displacing the *cheap clocks*—styled, in the report from which we quote, "atrocious trash," (*l'atroce camelote*)—of the Germans and Americans. About 18,000 of the small movements for traveling clocks are turned out annually in this district, and the manufacture of musical boxes has also gained larger dimensions. The trade of Montbéliard which amounted to about 7,000,000 francs, in 1877, is now said to be over 9,000,000.

Our authority next deals with the district of Saint Nicholas d'Aliermont. The situation in 1867 was as follows: Of the 2,500 inhabitants residing in this locality, about 1,000 were employed in horological pursuits. They manufactured chronometers, scientific regulators, the better class of clock movements, especially for traveling clocks, alarums, electric apparatus, etc; and, according to information gathered in the district, about 144,000 movements of variout sorts were made during the year, worth a little over 1,00,000 francs. The largest share of their manufactures went to Paris, the next best customers being London. About 50,000 kilos. of metal, nearly all brass, were employed in the construction of these 144,000 movements. The watch and clock makers of St. Nicholas worked formerly at their homes, the same as their fellow craftsmen in Switzerland did, and still do in some parts; but the severe competition of the Jura forced the manufacturers of Saint Nicholas to adopt the new mode of production, and to introduce machinery, necessitating the erection of large workshops, where the artisans work under the direction of *chefs* and overseers. Women are also employed, and such jobs as polishing, pivoting, and mounting of wheels are allotted to them. Saint Nicholas has also made progress since 1867, the means of production have been perfected, and business has increased from 1,000,000 francs to 1,500,000. When speaking of the clock trade of Paris, Mons. Saunier states that that city, like other horological centres, such as Geneva, Besancon, Locle, La Chaux de Fonds, etc., does not produce the principal elements of a clock itself, but imports them from localities already mentioned. Paris does only the finishing and casing, and then brings them into commerce under the name of *Paris clocks*. "Those emanating from our good makers," says he, "are unrivalled for perfect movements and tasteful exterior; but unfortunately, here as elsewhere, good makers are not the most numerous. We construct chronometers and regulators and artistic time-pieces which are really remarkable, bearing the stamp of excellence and taste, but the number is *very limited*."

In 1857 Paris had about 3,700 watchmakers, to which may be added the greater part of workmen employed at telegraphic apparatus. Employers and assistants formed a population of 4,000 industrials, whose trade, amounting to 20,000,000 francs in 1860, supplied a livelihood to at least 20,000 persons. After allowing for the cost of the *roulants*, for watches sold by jobbers, for materials from the factories, together about 5 or 6,000,000 francs, we have still from 14 to 15,000,000 as the profits and salaries of Parisian watchmakers. The above figures are given on the authority of the Chamber of Commerce. The Paris of 1878 is the great market of the watch trade, although it manufactures but little, and buys what it sells in Besancon and Switzerland. It still remains, however, the centre of the pendule manufacture, an industry which has rapidly grown these last few years; and the *Quartier du Marais* (the Clerkenwell of Paris) can boast of an annual production of 250,000 clocks, and over 300,000 alarums, lamp-movements, compteurs, etc. The telegraphic apparatus, the most of which come from the Franche-Comté or Saint Nicholas d'Aliermont, are also finished in Paris. Another branch of horological industry has also become very important in Paris, viz., the manufacturing of watch materials, comprising pendule anchors, springs, hands, dials, and a variety of other pieces which are used in the finishing process of movements and cabinets, and of all those numerous and variously shaped frames for alarums and cheap clocks. The present horological population of Paris is computed at about 8,000 (2,000 masters and 6,000 employees), and the amount of business at 23,000,000 francs.

The production of chronometers and scientific time-pieces seems to have remained stationary in France, and Mons. Saunier says that his report on the subject in 1867 holds good to-day.

All the component parts of chronometers, etc., were at one time made in Paris, but such is not the case now; and this class of work, particularly the movements, is almost monopolized by Saint Nicholas. Some few of the Parisian chronometer makers still construct their own escapements, but all the rest buy their chronometers completely finished, and have no other trouble than to observe and regulate them. It is true this operation is the most delicate, requiring precision and a certain amount of experience; and a good financial position will contribute no little to success, as it is desirable to keep and observe these timekeepers for a considerable time before offering them for competition or for sale. Watchmakers who devote themselves to the adjustment or superintend the manufacture of such delicate timekeepers are more artists than artisans. Chronometers of good French makers will stand comparison with the best English ones, which Mons. Saunier calls excellent. He attributes the limited extent of French chronometry to their long wars and maritime disasters, by which the English makers profited; he thinks, however, that the *ateliers* of St. Nicholas would give a great impulse to this art were it not for the want of markets, which have long been flooded with English products.

The report finishes with a review of the French watch trade, from which we cull the following facts: The watch movements are manufactured at Beaucourt, Montbéliard, Clules, and a few other less important localities. Messrs. Japy fréres, of Beaucourt turned out 640,000 movements in 1865, worth 1,500,000 francs. About 140,000 of these movements were bought by Besancon and the rest went to Switzerland. The district of Montbéliard, particularly the valley of Selencourt, supplies another 215,000 movements annually, and a large quantity of pinions, of a total value of 700,000 francs, Besancon and

Switzerland being again the purchasers. The business of the above mentioned districts has augmented since 1867 to the extent of about one-third, the annual production being 1,500,000 movements. Just now, however, trade remains stationary, owing to the commercial crisis which the Swiss watch trade has been undergoing these last two years. Cluses, which is the depot of the horological industry, in the Departement of Upper Savoy, suffers from the same cause, and the present production shows but little advance on that of 1867 (1,400,000 francs in 1867, 1,500.000 francs in 1878).

Switzerland has always been the best customer for French movements, and out of 950,000 movements and over 1,000,000 sets of pinions manufactured in 1878, 700,000 movements and an equal number of assortments of pinions were exported to that country.

Beaumarchais.

THIS extraordinary man, whose real name was Pierre Augustin Caron, was born in 1732. His father was a watchmaker of the Quartier Latin, and he was the only boy of six children. He was brought up to the paternal calling, for which, in his early years, he seems to have had but little taste, and to have been much neglected for music, for which he was passionately fond.

Of the education he received we have very little means of judging; it could not have been very liberal, but he spared no labor, in after yerrs, to make up for its deficiencies. At this period, however, when the almost oriental lines of caste, which had obtained under the Grand Monarque, were being broken down by the freer manners of the court of his successor, and class was gradually blending with *bourgeois*, he was making rapid strides in education and refinement, and in these respects was equal, if not superior, to his descendants of a century later. Thus we find the elder Caron to have been a man of some cultivation. Two of the sisters were remarkable for taste, wit and educated intelligence; one was a very fine musician, the other, Julie, who retired later in life into a convent, is not unknown in literature. Thus we find that the early youth of the future author of "Figaro" was passed in an atmosphere, and among associations, more genial than his birth might lead us to suppose.

Young Pierre was decidedly precocious, and a sad scapegrace, and probably sat to himself thereafter for the portrait of Cherubino. At thirteen he was in love with a girl several years older than himself, and,when she laughed at him,meditated upon the desirability of suicide. Two or three years later his father expelled him from home on account of irregularities of conduct, taking care, however, first of all that he should find a safe shelter beneath the roof of a near relative, whence the prodigal wrote very penitent letters, to which the father replied by an offer of reconciliation upon certain conditions, which reveal the nature of the offences. Among others, were that no orders were to be taken or executed in the business without his knowledge and authority, a condition which points to speculations—that he was to rise at six, and work until supper-time, against which we may write predisposition to idleness; that he was not to go out pleasuring except on Sundays, and then among only his relations, and that he was always to be home at the latest—upon which we comment, love of late hours and indefinite company; and that the only time he should give up to music was between supper and bed-time. Rather rigorous conditions these, would think apprentices of the present day. Nevertheless the culprit assented to them all, and benefitting by the lesson he had received, applied himself so diligently to his trade, that at twenty he invented a new system of escapement, which proved to be a very valuable improvement in watchmaking. His discovery, published in a number of the *Mercure*, 1753, was impudently appropriated by Lepante, watchmaker to the Luxembourg, who trusted for impunity to the obscurity of the inventor. But little did he know Pierre Caron, who at once commenced a lawsuit against him, the first of many, for his life was one long series of litigations, one of which extended fifty years beyond it. The Academy of Sciences, before which the question was brought, decided in his favor. This affair made some noise in Paris, and even attracted the attention of the court. The king ordered one of the two watches, and Caron presented to Madame de Pompadour a tiny watch, of exquisite make, set in a ring; after this he was employed by all the courtiers, and took the name of the "King's Watchmaker."

"As soon as Beaumarchais appeared at Versailles," writes a contemporary, "the women were struck with his lofty stature, his slender, elegant figure, the regularity of his features, his bright animated complexion, his confident bearing, that air of command which seemed to raise him above all who surrounded him, and finally with that involuntary ardor which is exhibited on their appearance."

One day a very handsome lady, about thirty, brought a watch to the shop to be repaired. A glance gave him his cue; he requested and obtained permission to be himself the bearer when it was finished. The lady was the wife of M. Francquet, a clerk of the royal kitchen, who was very old and infirm. She conceived a violent passion for the young watchmaker, and the husband seems to have made no objection to the close intimacy that ensued; indeed, so complaisant was he that a few months afterwards he made over to him his office, in consideration of an annuity, and, to complete the obligation, died soon afterwards. Within eleven months of the demise of M. Francquet young Caron espoused the widow and assumed the title of De Beaumarchais, from a fief supposed to belong to her—a fief which, it is probable, existed only in his imagination. She survived her second nuptials scarcely a twelvemonth, and, having neglected to register the marriage contract, he lost all her praperty. Those musical studies which his father had so rigorously restrained, now stood him in good stead, and were the means of his first real advancement. Besides being a very fine performer upon the harp, an instrument then scarcely known in France, he had made some improvements in its construction. His success was so great that Louis' four maiden sisters desired to have 'a taste of his quality,' and in a short time he became their musical instructor; but not for hire, he soared too high for that. Such was the favor and familiarity he now enjoyed at court that on one occasion, every chair being occupied when he entered the music-room, so eager was the king to hear him that he pushed his own seat towards him and insisted upon his taking it. He even won the good opinion of the not too sociable dauphin, who paid him the high compliment of saying, "He is the only man who speaks the truth to me."

That such favors should slightly intoxicate a young *bourgeois*, and inflate him with exaggerated notions of his merit, is not at all surprising. Nature had created him something of a coxcomb, and such associations were not calculated to correct that tendency. These failings and jealousy of his sudden rise, made him many enemies among the courtiers, who took frequent opportunities of mortifying and insulting him. One day a young noble requested him to examine his watch which he asserted was out of order. "Since I have left off the business I have become very unskilful in it," replied Beaumarchais, coolly. "You will not refuse me this favor," persisted his tormentor. Beaumarchais took it, held it up as high as he could on pretence of examining it, and then let it fall. "I warned you, monsieur, of my unskilfulness," he said, with a low bow, and passed on.

His influence with "mesdames" enabled him to confer a favor upon a person whose gratitude laid the foundation of his future colossal fortune. Paris du Verney, the celebrated financier, had just erected the *Ecole Militaire*, but the building and its purposes having been designed by Pompadour, who, since the beginning of the seven years' war, had fallen into disfavor, was looked coldly upon by the royal family, and during nine years he had vainly entreated a royal inspection of his work, which lanquished for the want of such patronage—he was now a very old man, and this visit had the most desirable effect of his life. It is a striking proof of the consideration in which Beaumarchais was held at the time when we find so rich and noted a man as Du Verney applying to him to bring about the accomplishment of his wishes. And he had not mistaken his m n; in a short time the clever young courtier prevailed upon the king's sisters to visit the *ecole*, and soon afterward the king himself followed their example. As a reward for this service Du Verney gave him a share in a speculation to the amount of $60,000 francs, and thus commenced a connection which brought much wealth to Beaumarchais, and which was dissolved only by the death of his patron.—*Temple Bar.*

Precious Stones and Gems.

BY EDWIN W. STREETER.

THE Orloff, or Amsterdam Diamond, weighs 194¾ carats, and is set in the top of the Russian Imperial Sceptre. It is of pure water, but not cut to advantage, the upper surface having concentrated rows of three-cornered facets, and the lower surface four-sided facets. Its size is about that of a pigeon's egg.

It came originally from one of the old mines of India, and tradition reports it to have been one of the eyes of the idol Sheringham, in the temple of Brahma. Later, with many others, it graced the throne of the Shah Nadir, of Persia. When he was murdered, it was stolen by a French grenadier who had served there. He fled with it to Malabar, and sold it to an English sea captain for £2,000. It was brought to England, and sold to a Jewish merchant for £12,000. He in his turn sold it to the Armenian merchant, Shafras, at great profit; and in the year 1775 Catharine II. bought it from Shafras, in Amsterdam, for £90,000, giving him at the same time a title and a pension of £4,000 for life.

Dr. Beke relates that in 1832, at the siege of Coocha in Corassan, a fragment of diamond, weighing 132 carats, was found, by means of Abbe Mirza, who said that a poor man living in his family had used it as flint. Its form gave rise to the supposition that it was a piece of the Koh-i-noor.

The diamond, well known under the name of the Shah, is about half the size of the Orloff, and was given to the Emperor of Russia by Prince Cosroes, younger son of the Abbe Mirza, when he was in St. Petersburg. It weighs only 86 carats, but is perfectly pure, without a flaw or cloud; and it is interesting, inasmuch as it is only partly cut, many of its *natural* octahedra being preserved. The cut facets contain Persian inscriptions, and there is a little groove round the top of it, to which a cord was fastened in order that it might be worn around the neck.

The most perfect brilliant in existence is the celebrated Pitt or Regent, which is among the French Crown Jewels. It weight 136¾ carats. The Duke of Orleans, Regent of France, bought it of Pitt, the English Governor of Fort St. George, for £135,000. It was said Pitt had obtained this stone in Golconda, in the year 1702. It came from the mines of Parteal, forty-five leagues south of Golconda. It was found by a slave who, in order to hide it, wounded himself in the thigh, and hid the stone beneath the bandage. He at length acknowledged this to a sailor and promised him the stone if he only would secure him his freedom. This sailor enticed the slave on board, took from him his diamond, and then threw the slave into the sea. The murderer sold the diamond to Pitt for £1,000, spent the money quickly in excesses of all kinds, and from a murderer became a suicide.

Another story is that Pitt bought the stone in 1701 of the famed Jamchund, the greatest diamond merchant in India, for £12,500. A Commission, consisting of the most experienced French jewelers, valued it at £480,000. It disappeared when the Tuilleries were plundered, in 1792, with the other Crown Diamonds, but in some mysterious way came to light again later on. The republic then pledged it to the merchant Treskon, in Berlin. Again redeemed, it ornamented the sword of Napoleon I. Before it was cut it weighed 410 carats. In the cutting it was reduced to nearly one-third its original size.

The Florentine Diamond, among the Crown Jewels of the Emperor of Austria, weighs 139½ carats. It is of pure water, of beautiful form, and, notwithstanding that its color is somewhat of a citron tint, it is valued at £105,000. It is supposed that this is the largest and most costly of those diamonds which Charles the Bold lost at the battle of Granson. Charles the Bold is known to have valued the the largest of those he lost at the worth of a province. It was found by a Swiss, in a little box, accompanied by a costly pearl. The man regarded his find with contempt, and threw it under the wagon again, thinking they were merely bits of glass. He thought better of it, however, picked it up again, and sold the two gems to a priest in Montagny, for a gulden, who resold them for three francs.

At this time there lived in Berne a rich merchant, named Bartholomew May, who, partly by relationship, and partly through business, was connected with Italy. He bought this diamond for £200 and a small present to the man through whose instrumentality he had been enabled to purchase it. He sold it to a Genoese for a large sum, but Ludovico Sforza bought it of the Genoese for twice the amount he had given. It afterwards came into the possession of Pope Julius II., who presented it to the Emperor of Austria.

The Sancy Diamond weighs 53½ carats. Its early history is very doubtful. According to Karl Emil Kluge, it came originally from India and entered Europe about the fifteenth century. It fell into the hands of Charles the Bold, Duke of Burgundy. It was either lost by or stolen from him, and came into the possession of the King of Portugal. His finances not being in a flourishing condition, *he* sold it, with other stones, to a French merchant, for a large sum of money. In the sixteenth century it fell into the hands of a Huguenot nobleman, Mons. le Baron de Sancy, of whom Henry III. borrowed it, for the purpose of pledging it to the Swiss Government. The servant who was trusted (according to the Baron's own account) to carry it to the king was waylaid and murdered. On hearing of his servant's death he remarked, "my diamond is not lost. He was right. The faithful servant had swallowed it, and on opening his body it was found in his stomach. After this (through what means is not known) it came into the possession of James II., of England, who, when he fled into France, in 1688, carried it with him. Wanting money, he made it over to Louis XIV., for 625,000 francs. It passed from him to Louis XV., who wore it in the clasp of his hat at his coronation. In the Revolution of 1792 it disappeared (as did also the famous Blue Diamond of 67½ carats), but came to light again in the time of Napoleon, and was sold by him to the Emperor of Russia for 500,000 silver roubles (£75,000).

The largest diamond found in Brazil weighs 254 carats, and is called "The Star of the South." It is a brilliant of purest water. Its general form is a rhombododecahedron, with a very blunt point upon each of its faces. On one of the faces of the diamond a moderately deep hole is noticeable, and, by help of a lens, stripes were seen in the interior of the hole. It is evident that the diamond belongs to the group of diamond crystals which have their bed in rocks of crystallized ore, and which probably are to be numbered among the metamorphic mountains of Brazil.

The "Star of the South" was found in July, 1853, in one of the mines of Bogagen (a district in the province of Minas-Geraes), by a poor negress who was engaged in the works. It was purchased by M. Halphen, and displayed in the Paris and London Exhibitions, and was conspicuous for its brilliancy, owing to its purity and perfect cut. About one-half of its weight was lost in cutting. Its form is an oval-round brilliant, 39 millimetres long (1⅝ inch), and 29 broad, but only nineteen thick. Its purity is extraordinary, and under light it shows a rose tint, not unpleasant to the eyes.

Another celebrated Brazilian diamond, weighing 138½ carats, is among the treasures of the King of Portugal. It was found in 1775 by a negro, a few miles north of the Rio Plata, and as a reward he obtained his freedom and a yearly income of £50.

An anecdote is told, for which Mann is answerable, that three men, guilty of great crimes, were banished to the interior of Brazil for life. They were never to approach either of the towns, or to mix with other people, upon pain of life-long imprisonment. These men went into the most unfrequented places in the land, searching for valuable matter. They wandered up and down for six weary years, by the shores of the rivers, always in danger of becoming the pray of man or beast. At length they came to the River Abaite, and at a time when, through a long season of dry weather, a part the bed was exposed. Here, while seeking for gold, they came upon a diamond nearly an ounce in weight. They had now to take into considera-

tion the strict law against the unauthorized seeking for diamonds, and the great desire they had to obtain their freedom. They, therefore, consulted a priest who not only did not betray them, but advised them to trust to the good-will of the government; and he himself accompanied them to Villa Rica, and obtained for them an audience of the Governor. The Governor was so astonished at the size of the stone that he would not trust his own eyes alone, but called together his officers, who declared it to be a genuine diamond. The Governor thereupon bestowed upon the finders the rights of citizenship. The priest was sent with the stone to Rio de Janeiro, and thence to Lisbon, when the King confirmed the pardon of the criminals, and their restoration to the rights of citizenship. To the priest he gave a good preferment. The stone remains likewise in the Treasury of the King of Portugal.

The "Pacha of Egypt" is cut on eight sides, weighs 40 carats, and cost 700,000 francs.

The Pigott Diamond, brought from India by Lord Pigott, weighs 82¼ carats. In 1801 it was sold in a lottery for 750,000 francs; and in 1818 it passed into the hands of Messrs. Rundell & Bridges.

The "Nassac," formerly in the possession of the East India Company, weighed 89¾ carats; but since Lord Westminster had it cut anew, it weighs only 78⅝ carats. Its value is about £30,000.

The largest diamond in the Green Vaults of Dresden is 48½ carats in weight. It is nearly as large as the "Sancy." There are also here some parures of diamonds, marvellously beautiful, and four very valuable yellow brilliants, the largest of which is 117¼, and the smallest 52½ grains respectively.

THE CROWN JEWELS OF ENGLAND.

The Imperial State Crown of Queen Victoria was made by Messrs. Rundell & Bridge, in the year 1838, with jewels taken from old crowns, and others furnished by command of the Queen. It consists of diamonds, pearls, rubies, sapphires and emeralds, set in silver and gold; it has a crimson velvet cap with ermine border, and is lined with white silk. Its gross weight is 39 oz., 5 dwts. troy. The lower part of the band, above the ermine border, consists of a row of 129 pearls, and the upper part of the band of a row of 112 pearls, between which, in front of the crown, is a large sapphire (partly drilled), purchased for the crown by King George IV. At the back is a sapphire of smaller size, and six other sapphires (three on each side), between which are eight emeralds.

Above and below the seven sapphires are fourteen diamonds, and around the eight emeralds, one hundred and twenty-eight diamonds. Between the emeralds and the sapphires are sixteen trefoil ornaments containing one hundred and sixty diamonds. Above the band are eight sapphires surmounted by eight diamonds, between which are eight festoons consisting of 148 diamonds.

In the front of the crown, and in the centre of a diamond Maltese cross, is the famous ruby said to have been given to Edward, Prince of Wales, son of Edward III., called the Black Prince, by Don Pedro, King of Castile, after the battle of Najera, near Vittoria, A.D. 1367. This ruby was worn in the helmet of Henry V. at the battle of Agincourt, A.D. 1415. It is pierced quite through, after the Eastern custom, the upper part of the piercing being filled by a small ruby. Around this ruby, in order to form the cross, are seventy-five brilliant diamonds. Three other Maltese crosses, forming the two sides and back of the crown, have emerald centres, and contain respectively 132, 124, and 130 brilliant diamonds.

Between the four Maltese crosses are four ornaments, in the form of the French *fleur-de-lis*, with four rubies in the centres, and surrounded by rose diamonds, containing respectively 85, 86, and 87 rose diamonds.

From the Maltese crosses issue four imperial arches composed of oak leaves and acorns; the leaves contain 728 rose, table and brilliant diamonds; 32 pearls form the acorns, set in cups, containing 54 rose diamonds and one table diamond. The total number of diamonds in the arches and acorns is 108 brilliant, 116 table, and 559 rose diamonds.

From the upper part of the arches are suspended four large pendant pear-shaped pearls, with rose diamond cups, containing twelve rose diamonds, and stems containing twenty-four very small rose diamonds. Above the arch stands the mound, containing in the lower hemisphere 304 brilliants, and in the upper 244 brilliants; the zone and arc being composed of thirty-three rose diamonds. The cross on the summit has a rose-cut sapphire in the centre, surrounded by four large brilliants and 108 smaller brilliants.

SUMMARY OF JEWELS IN THE ENGLISH CROWN.

1 large ruby, irregularly polished; 1 large broad-spread sapphire; 19 sapphires; 11 emeralds: 4 rubies; 1,363 brilliants; 1,271 rose diamonds; 147 table diamonds; 4 drop-shaped pearls; 283 pearls.

THE FIRST KNOWN APPLICATION OF DIAMONDS FOR ORNAMENT.

The adaptation of the diamond to personal ornament is grounded on its glorious lustre, its beautiful play of color, and its great hardness, all of which are brought prominent forward by cutting the stones in a variety of forms. This is a process by which the rough stone loses about one half of its original weight.

The Syrians seem to have been the first to apply the diamond to personal ornament, although it was an article of commerce much earlier among the people of the east. They valued it highly, carried it as amulets, and gave to it many medical virtues. It was regarded also as a safeguard against madness.

In early times, the *rough* stone was worn or polished only on its upper surface. It was in this form that it was used to ornament state goblets, rellquaries and crowns.

It was not until the time of Charles VII. that the French ladies began to adorn themselves with diamonds. The well-known Agnes Sorrel seems to have been the leader of this fashion. Under Francis I. the ladies indulged to such an extent in diamond ornaments, that it gave rise to the saying, that "the ladies of France carried mills, forests, and lands, on their shoulders." The Luxus or Sumptuary Laws, in the reign of Charles IX. and Henry IV., were aimed at this extravagance.

It was not until after the time of Ludwig van Berquem that diamonds were used so much for the hair, throat, ears, shoulders, arms, wrists and fingers.

The original cut of the diamond was that of the table-form, with a row of facets above; and it was not until the year 1520 that the rose cut was introduced, and the form of the brilliant was not known until the reign of Louis XIII., of France. It was Cardinal Mazarin, in 1660, who had the first diamond polished. Among the diamonds of the French Crown is one of the twelve which received the form of the brilliant, and is known as the Tenth Mazarine.

The diamond is very rarely engraved; up to the time of Pliny it never appears to have been attempted. The Duke of Bedford, however, has a diamond with the head of the philosopher Posidonius engraved on it; and although Kluge believes this to be an isolated example, yet there are others in existence. Last year I had one placed in my hands for sale. It was a thin stone, the size of a fourpenny piece, engraved with the head of an emperor. The price was £1,000, and had the owner consented to take less, I could have found a purchaser. This stone was exhibited in the last Paris Exhibition.

ROUGH DIAMONDS.

The valuing of rough diamonds requires much technical experience. Although the diamonds of all parts of the world possess similar characteristics and general appearance, yet the stones from different places have some special peculiar ties by which good judges are at once in a position to declare the locality whence they have been obtained, although they cannot always define the grounds of their judgment.

In valuing rough diamonds it is of primal importance to consider the following points: Firstly, the form and proportions of the crystal, on which mainly must depend the loss of weight in cutting, as an irregular or broken piece naturally requires a greater sacrifice of weight to turn out a perfect brilliant than a well-proportioned crystal. Secondly, heed must be taken to distinguish the degrees of color, and purity of the specimen. The best forms to choose are the octahedral and the rhombo-dodecahedral. It must not be forgotten that in estimating large rough diamonds, especially those from the Cape, that certain tints of color may be brought out in the cutting, which do not appear in the stone in its rough state; perfect polish, and the power of reflection natural to the brilliant, intensify any tint of yellow existing in the stone. This observation does not apply to river stones, but rather the converse. It is difficult, nay impossible, to quote a standard price for rough diamonds, as, from what has already been said, it will be easily understood that the value must vary immensely according to size and quality.

The Paris Exposition.

To the Editor of the Jewelers' Circular :

I AM one of your London subscribers, and have just returned from a run through the Paris Exposition. As I notice in your esteemed periodical that news and criticism of all kinds is always welcome, I venture to send you a few notes made upon some of the chief exhibits in the silverware and jewelry line. Perhaps you will find my comments rather late in the day, but I am quite willing to run my chance in the hope that you may consider my communication worth the space in your valuable publication. And here let me say that everyone to whom I have shown the JEWELERS' CIRCULAR AND HOROLOGICAL REVIEW is astonished and delighted at the varied excellence of its contents, and specially pleased with the practical articles which it contains. I wish we had as live a paper representing our trade in this country.

I had a look at the Philadelphia Exhibition, but the European manufacturing artists in precious metals were not well represented. It is otherwise in Paris, which, as everyone knows, is the centre of this branch of art, and so near London. Indeed, the best show in the Exhibition is made by Messrs. Elkington & Co., of London, who are well represented by some of their choicest works. One of the chief features of their display is a very fine plateau in repoussé silver, decorated with illustrations of the chase. This piece was designed by Mr. H. W. Willms, the leading artist of the house, and is unsurpassed in taste and finish by the finest French productions. Another fine dish in repoussé gold, silver and iron, represents the "Finding of Moses," from the original of Paul Delaroche. The figures are in gold, while the rim is appropriately set with four iron *plaques*, decorated with Egyptian designs of the Sphinx, winged scarabæus and lotos plant. Two rosewater dishes in silver are exquisitely beautiful. The centre is occupied by a "ring" of children carrying fruit and flowers, emblematic of the four seasons, and surrounded with a frieze inscribed with the names of the months, to which *placques* set in the rim correspond. In these are introduced female figures, and the signs of the zodiac appropriate to the respective month. The workmanship is such as is to be expected from this famous house.

M. Meissner, of Paris, is well known to the trade by his electroplated goods. His productions always manifest great excellence, sometimes being based on the antique modes which abound in the museums of the French capital, while at other times he gives original emanations of his fertile fancy. He is represented by a chaste *placque*, evincing the influence of antique study, and a wine cooler, which is conceived in the florid style of the 17th century. Both these works are well deserving of attention, especially the former, which is very finely worked and at the same time simple and broad in treatment.

One of the most curiously artistic examples in the Exhibition is a rosewater dish in copper, brass and silver, manufactured by J. H. Singer, of Frome, a small provincial town in England. Mr. Singer educates his own artist-artisans, and his establishment has increased until his works are well known to all connoisseurs. The dish to which we refer is in copper, with raised figures in silver, and the rim is of brass, finished with copper lines. The effect is striking, but very admirable, and the piece has won universal commendation.

Mr. Fitzaine ranks among the most eminent goldsmiths of Paris, and is notable as one of the leading workers in precious metals who apply their material to the production of articles other than those of personal wear. Hence Mr. Fitzaine is represented by an elaborate inkstand, with taper-holder and clock, an ewer and basin, a card reeeiver and very graceful candelabrum with several branches. The inkstand is an idealization of a Roman trophy, with figures of legionaries introduced, and the candelabrum is supported by an Eastern figure, in a way suggesting an adaptation of the Greek Caryatides. This display is specially interesting, for there are very few art workers in the precious metals who can produce such articles.

Mr. Odiot, of Paris, is another manufacturer who uses the precious metals in works of household decoration. A large vase, by him, set with bas-reliefs of Neptune and his Nymphs, and decorated in the style of the 18th century, is worthy of attention ; and a candelabrum in foliated work, with figures encircling the pillar, is very fine. Another vase, with pedestal, combines foliated work and figure work with rare success, and exhibits the mastery which comes to a true artist by long experience of skill and judgment.

Messrs. Rouvenat & Co. make one of the finest exhibits in the building. This well known firm present a collection which is amazing, not for its enormous cost, but for the grace, beauty and pure artistic taste displayed. In some instances old models have been imitated, but more frequently the designs are original, and comprise all articles of personal decoration, from the plain ring, elegant in its simplicity, to the *parure*, which is worth a priceless ransom. A necklace in brilliants is specially wonderful. It is, as it were, made of golden lace-work, fretted with diamonds, eleven elaborate roses encircling the neck, with three pendant rosettes and tassels in front. The workmanship of this wonder of art is worthy of the design, and the design and the work is one of the choicest features of the entire jewelry display.

Christessen, of Copenhagen, presents a very peculiar display, in which he exhibits reproductions of the old Norse jewelry, and also original designs in which the antique spirit of his country is blended with the necessities of modern form. A centerpiece for fruits and flowers is very notable as introducing the Scandinavian serpentine lining and crossing in the engraving, and mystical marine figures as supporters. The rings and brooches are very similar to the Erse patterns, but, strange to say, are finished in the Etruscan method lately popularized by the Castellani, of Italy. This exhibit is one of the most interesting in the building.

Marshall & Co., of Edinburgh, Scotland, exhibit a collection of bracelets, lockets, and crosses, in which the old patterns of Gaelic jewelry are adapted and reproduced. These goods are very pretty, and, being made in silver, with black enamel and pebble setting, are not costly, while very elegant and useful.

Emile Philippe, of Paris, has taken honors in every exhibition in which he has competed ; and his bold, strong work compels admiration. Among his best examples are a race cup supported by Gryphons, and a chaffing-dish which is furnished with medallions and female busts of admirable execution.

Messrs. Alinet, of Paris, are noted for clock cases and candelabra of rare artistic qualities. Their style is bold and broad, while possessing a remarkable wealth of detail and finish. They disdain the Cupids and Graces who are the eternal ornaments of French designs, and prefer to display the decorative beauties of inert form. In this they are very successful. Special reference should be made to a clock case in scroll, and a candelabra in fluted work, relieved at rare intervals with suggestions of foliage.

Miroy Brothers, of Paris and London, exhibit a large and varied display of pendules in bronze and marble, and M. Houderine shows some very choice statues and statuettes in bronze, and some vases after the Greek antique, in which the model has been followed with rare fidelity.

The house of Lefevre, Paris, makes a fine display in bronzes, displaying clocks, vases and pedestals, of infinite grace and ornamentation. Their specialty is figure modeling and floral designs, and numerous elaborate examples evidence the skill of their artists and the ability of their workmen.

M. Jules Gaux is another worker in bronze who exhibits some very important examples which betoken deep thought and careful study, conducing to a successful result. A large candelabrum and a clock case in *renaissance* style are the chief features in his exhibit, the latter being specially commendable.

M. Servant, of Paris, is a bronzist who has drawn inspiration from Venice and Nuremberg. In his candelebras we find the influence of St. Mark's, and in his pendule we appreciate the Gothic sentiment, although adapted, altered, elaborated and adorned by the original genius of the designer.

The above are some of the exhibits most worthy of notice. I have more in my notebook, and should this letter prove acceptable, will forward them to you. HATTON GARDEN.

The Gold and Silversmiths' Work at the Paris Exposition.

Translated from the "Gazette des Beaux Arts" for the Jewelers' Circular, by F. Vors.

FOR the past twenty-five years the nations following the example of England, and stimulated by that of France, have been led to aspire to the beautiful, and have been making their way towards that land of promise where art flourishes. Some have come close enough to it to make us tremble for the prestige of our good taste. It is a match between Europe and us, and the Exhibitions are stopping points in the game, when the players reckon up the points they have made. Until now we have kept the lead; but when we gauge the progress of our opponents, our success is matter for thought.

If in some special branches of art and industry the contest becomes serious and spirited, there are others in which we are not yet threatened; and among those the manufactures of precious metals and bronzes are perhaps those in which France keeps a better established superiority. I do not say that everything is good, and I do not delay to modify what might be excessive and dangerous in the indulgence of too good an opinion of ourselves; we are the first, but only because, with few exceptions, the production of foreigners is poor. If the English made in these branches of art the efforts they have made in the manufacture of furniture, if the American Tiffany pushed his progress a little further, if Italy had many Castellani, our superiority would be in danger.

Goldsmiths and bronzemakers, we are led by chance, following our own personal notions, having no school nor advice nor superior direction. All we have to sustain us is the luxury of the purchaser, and the passion for gain of the manufacturer. No artist has yet become permanently fond of that "art of the metal" which gives, for he that understands it, as much enjoyment as the sculptor finds in the soft plasticity of clay and crisp resistance of stone, and the painter in the magic of his palette.

If from a block of marble a god, a table, or a vase can be made, gold, silver and bronze have protean qualities which can be worked *ad infinitum*. These metals belong to the painter by the enamel, the variety of patinas produced by their numerous alloys and by their union with stone. They take from architecture the sharpness of its outlines, the brilliancy and strength of its details; they retain in an indelible manner the ornament of the engraver, and for the sculptor they are the most imperishable substances in which to shape a thought. Our artists of to-day must be absolutely ignorant of these virtues, and they must never have studied the resources of casting, of chasing, of engraving and of enamel; for if they had, like the great masters of ancient art, they would have come of themselves to metal, not as a workman doing uninteresting work, but as true masters who would recall this art to a rank worthy of it, and crown themselves with new glory. They have often been asked to do it. Auguste, Thomire, Odiot, Sr., and Biennais, in the grand days of the Empire gave new life to metalwork, and we saw Cahier, Fanconnier, Wagner having recourse to our architects and our sculptors. It was on the advice of Chenavard that Fanconnier made his first attempts at the Renaissance style, and it was for him that Barge composed his first designs, cast and chased them. Liénard, Ganneron, Plantard and Geoffroy de Chairmes worked for Wagner. Vechte was then one of the masters of the art of chasing (the Museum of Luxembourg has two vases of his, but his best works are in England); Justin and Nevilé used to design for Depouchel; Rude and Siniart modelled, for the Duke de Luynes, the silver statue of Louis XIII, and the Minerva of ivory, gold and silver, similar to that of Phidias, but made no further attempts in that line after these two. Morel employed Klagmann, and, as Th. Gantier says in his notices, "Radier, David, Fenchéres, Cavalier, Préault, Schœnwerk, Pascal, Rouillaud, have been translated into gold, silver and oxydized iron by Froment-Meurice,"

But all these artists did not understand metalwork. For them it was only a way of making money—of paying for marble, or canvas; and the silversmith's model completed, they went back thoughtfully to an art which they thought more worthy and grander. Even those who were born, so to speak, in the chasing shop, Carrier-Belleure and Gilbert, thought they felt their wings palpitate, and threw away the file and the hammer, although they sometimes come back to the craft of their early days.

Of all the children of metalwork only two remained faithful to it, loved it passionately and devoted their time to it—the two brothers Fanniére. It is with them that we begin this rapid sketch—that honor is due to them. Modest and energetic workmen, beloved by those who know them, they live unostentatiously in a quiet part of the city far away from noisy competition, dreaming and creating, producing all their works themselves. Their works, already numerous, reflect well their natures—natures rather dark and serious, without any great vigor, but without weakness. All that comes from them is stamped with honesty and good faith; their productions are as pure as the metal they use. Perhaps they have kept that indefinable style of their early days, which seems a trifle odd to the youth of to-day, but which is not without a certain charm. In their compositions we find recollections of the masters I have named—Teuchais and Liénard, Pradier, Klagmann and Nevilé; but that is better than to have, like some others, elegant freedom, neo-Greek mannerisms, and tricks of "chic," of which fashion itself is getting tired. They are finishing a shield, begun twenty years ago (note their perseverance) where they have wrought in repoussé of steel the heroic personages of the "*Orlando Furioso.*" These equestrian figures in relief, raised on a soft and ornamental ground, recall the strength of some of Vechte's work. A delicious coupe, soft to the touch, relates the loves and the death of Adonis. The fine t me-piece, which belongs to Mme. Blanc, is of silver and lapis lazuli; it occupies the place of honor in the show case of the Fanniere. The two large figures seated on each side are powerfully modeled and chased with care and spirit. I like that sword in the shape of a claymore, presented to General Charette, and which, from the point to the pommel, is wrought of steel as true and pure as the hero of Patay. The hilt is ingeniously composed of weapons, and recalls the old Brittany legend. And if among several pieces of artistic work, and a quantity of jewels, we mention one more piece, it is the race cup given in 1875 to the Comte de Lagrange, representing Bellerophron's combat with the Chimera, we select it because it seems to us a good example ofnoble gracefulness,and because the execution, although it is soft and thorough,does not take anything away from the strength and character of the modeling.

But the Brothers Fanniere are outside of the narrow definition given to silversmiths. Industrial artists, but poets of form, they remain independent and carry on but little the commcreial part of the craft. They deal very little in the silverware which can be adapted to household use.

It is by those useful articles that the Christofle come under our notice first of all. They began by introducing to France the galvanoplastic process for gilding and silvering; and it seemed as if this artificial means of production was to lead to the downfall of all rival manufacture in making competition impossible. A large factory is built and rapidly augments; Mr.Chrisofle, Sr., vulgarizes the use of current silverware, but, little by little he improves the style of his manufacture. First came dinner sets like those that the houses of Caylar-Bayar and Boulanger make to-day, brilliant and richly constructed, suitable for hotels or the flashy dinners of persons with more weath than taste. When the life of the factory was assured, and the financial success of the house guaranteed by the mechanical production of plated spoons and forks and current articles, Mr. Christofle made his first attempt at art. This was in 1855, on a dinner set for the Emperor. All the sculptors of to-day remember having worked with feverish ardor at that important work under the direction of Gilbert. But nothing has been left of this work of their youth. Nor is there anything now of the dinner set of the City of

Paris, which was exhibited in 1867 by Mr. Christofle, Jr., and Mr. Bouillet. One disappeared in the ruins of the Tuilleires, the other in the fire of the Hotel de Ville. Silverware and jewelry have strange destinies; if a Louis XIV. does not send them to the mint to redeem a victory, it is some imbecile in arms who burns them on his ignoble funeral pile. These two fine works were in silvered bronze, but the grand set exhibited this year by Messrs. Christofle and Bouilhet is truly in silver, as that made for the Duke of Santonia, who displayed so many riches at the wedding of King Alfonso and poor Queen Mercedes.



Here at last our artists have largely contributed to the invention of patterns—no trivial work. Reiber was the architect who constructed the whole, while such sculptors as Mercié, Mathurin-Moreau, Hiolle. Lafrance and Gautherin modeled the figures. The general idea of it is simple : in the center the triumph of Amphitrite—the elegant outline of the daughter of Nereus, stands out slim, yet bold ; the outline is good, and small as it is, this pretty figure of Mercié is noble, and would not lose if it was augmented to life size. Beneath her are seated, in fine attitudes, Fresh-water and Salt-water, fishing. Tritons and Mermaids occupy the end pieces. The Seasons, modeled by Gautherin, furnish graceful motives to the candelabra, and two jardinieres serve as rests for reclining figures of Europe, Asia, Africa and America. Lafrance, in the four subjects, has been well inspired, he has put new life in the old classical subject, by lending to the figures a more lascivious grace. The four continents are what they ought to be at a feast—alluring—taken with that intoxication of the senses which comes from their climate, from their fruits, from their wines, from their sun ; they seem to offer to the guest all that the richness of the soil and the beauties of nature can give to the most sensual man. It is a delicious poem for the dinner table which will not be lost on people gifted with a little understanding.

In spite of these charming figures, and the delicate coloration of the silver, of which the brilliancy is toned down by soft touches of gold, the aspect of the set is solemn. For another, more modest in its prètensions, we are indebted to the easy style of Carrier-Belleuse. Groups of Bacchantes of children and satyrs give it a living animation The subjects are pleasing. The crystals make a glittering contrast with the ornamentation in the Louis XVI. style, These little people seem alive and are pleasant company at dinner. Of the same style and of the same sculptor are three pretty pieces of a coffee set.

Legal Regulations for the Standard of Gold and Silver Ware in the Different Countries of the World.

BY EDWIN W. STREETER.

In 1739 (George II.) the precious metals used by jewelers were exempted from the necessity of bearing a fixed standard. Other directions were also laid down as to the stamps to be applied. This law adverts to the prevalence of fraud.

In 1756 (George II.) the import duty upon manufactured silver was lowered to sixpence upon 10 ounces.

In 1758 the punishment for counterfeit stamping was increased to the term of 14 years' transportation.

In 1759 (George II.) the dues to be paid by the goldsmiths to the king for their license were increased.

In 1797 the duty on gold-ware was fixed at 8*s.* per ounce, and upon silver at 1*s.* per ounce.

In 1798 (George III.) was legalized the manufacture of gold-ware at 18 carats,

In 1803 new licensing duties were fixed for the manufacturers of precious metal ware; and in the subsequent year the duty on gold-ware was raised to 16*s.* per ounce, and that on silver-ware to 1*s.* 3*d.* per ounce.

In 1815 was enacted the most important of the rules now in force as to the duty upon precious metal wares; and in 1844 (Victoria) the penalties attached to counterfeit stamping of gold and silver-ware were fixed.

The most recent English law upon the standard of gold and silver-ware dates from the year 1854.

All gold and silver-ware manufactured in the United Kingdom is required to be tested and stamped; the cost of stamping amounting to 17*s.* per ounce for gold-ware, and 1*s.* 6*d.* per ounce for silver; and the duty is payable at the place of testing.

At the present time five legal standards exist for gold-ware: 22, 18, 15, 12, and 9 carat gold.

For silver-ware there are two: 11 oz. 10 dwt., and 11 oz. 2 dwts.

The lowering of the standard of precious metal ware met a great emergency..

Although English watches have always been in great demand in the United States of America, yet, owing to the quality of the standard, they were too costly. English watches *without* cases were therefore exported there. The Americans enclosed the watches in cases having a standard of from 10 to 16 carats, and sold them in South America and other markets at a price with which the English could not compete. The following gold-wares are exempt from the duties of stamping: Watch cases, gold setting for precious stones, chains, rings, bells, clasps for garters, necklaces, sliding pencils, needle cases, etc.

Among silver-ware there is an exemption of watch-cases, chains, beads, bracelets, necklaces, brooches, buckles, lockets etc., of whatever weight these may be.

Many articles are also exempt which weigh less than 10 dwts.

The penalty incurred by those who sell or export unstamped goods is £50, and, in case of inability to pay, confinement in a house of correction for periods varying from six months to a year.

The value of goods seized belongs half to the crown and half to the informer. For exported goods of gold and silver an export premium is granted which amounts to the costs of stamping; for gold, 17*s.* per ounce, and for silver 1*s.* 6*d.*

In the British colonies no laws are in force which regulate the standard of gold and silver-ware.

The Minister of Finance in France has had the goodness to communicate to us that in consequence of the disturbance of the archives, he is not in a position to forward to us the early laws regulating the standard of gold and silver-wares. We therefore avail ourselves of the information supplied in the well-known work by William Chaffers upon the old French laws regulating the standard of gold and silver-ware.

In the "Livre des Métiers," compiled by Etienne Boileau, Provost of Paris, from 1258–1269, we find in the preface that "no goldsmith may work gold in Paris which is not of the Paris touch, or better; which touch or standard surpasses all the gold which is worked in any other country; and no silver must be worked which is not as good as, or better than, the sterling silver of England."

In an ordinance of Philippe le Hardi, 1275, the silver workers were compelled to stamp their works with the sign of the town; and in the reign of Phillipe le Bel, 1313, gold was ordered to be stamped with the punch of the Goldsmiths' Company of Paris; and it was further ordered that each city should have a particular mark for works in silver. The same king (Phillipe le Bel) decreed that the manufacture of gold and silver should be restricted to pieces of a certain weight. This was for the double purpose of limiting the progress of luxury, and of reserving a sufficient quantity of the precious metals for coinage. Louis XI. and Louis XII. confirmed this decree; but as the Paris goldsmiths complained bitterly of this restriction, in consequence of the prelates, princes, and nobles getting their work done out of France, the king was induced to alter the law four years after, viz., in 1510.

An edict of the year 1554 commanded all goldsmiths, under fine of 1,000 livers and bodily punishment, to enter with their own hand in a register the weight of every piece of precious metal or precious metal ware, as well as the name of buyer or seller. This was somewhat modified in 1555; but it still exists in a milder form.

In 1631 a duty of *three sols* per ounce was laid upon all the precious metal work.

In 1633 this duty was compounded for by a sum of 24,000 livres, which the Paris goldsmiths had to pay, and 8,000 livres, which the wire-drawers and gold-beaters had to pay.

In 1672 the duty was re-established; and in 1674 it was still further increased.

In 1681 works of silver gilt were subjected to a like duty with silver. In this same year a fine of 3,000 livers, besides personal degradation, was inflicted for fixing the stamp of a high standard on false metal.

But for the same offence in the year 1724 the sentence was "d'etre pendus et etrangles."

Although Louis XIV. had stood pre-eminent in his use, nay, in the extravagant display, of precious metal ware, yet when a time of great scarcity arrived, he sent about 10,000,000 francs' worth to the mint for the purpose of raising money, and made it compulsary that the nobility and gentry should do the same.

In March, 1700, the early edicts of Louis XIV. against the luxury of precious metal wares were made more stringent. Under penalty of 3,000 livres and confiscation, no gold article was to weigh more than an ounce, and no silver-ware above the weight of 8 marks. No one dared to ornament their dress with gold or silver lace, nor were they allowed to use gold and silver to ornament carriage harness, liveries, or furniture of any kind. The result of these strict laws was that great quantities of gold and silver-ware were imported, whilst the weight of the article to be manufactured was limited in 1721 to 7 ounces. At the same time the standard of small gold-ware was fixed at 20¼ carats.

A law of 1746 decreed that the inner part or under surface of real gold lace should be of silk, and that of the false gold lace of red cotton, so that the two kinds of lace might be easily distinguished.

In 1763 a universal method of testing was commanded.

In 1765 the law determining that silver boxes lined with gold should be stamped with the word silver was remitted.

In 1769 it was required that all imported gold and silver-ware should be tested and stamped in the "Maison Commune."

A law of 1782 instituted the use of a new punch.

In 1783 the standard of silver-ware was fixed at 11 ounce 12 grains, and of gold-ware at 20¼ carats.

A law of 15th December, in the same year, gave to each of the communes in France a separate stamp.

Concerning the legal regulations of the standard of gold and silver ware now in force in France; we have the following information from M. de Parieu, who accompanies his communication with the remark "That the manufacture and the trade of gold and silver ware in France are placed under very strict regulations, which appear no longer in harmony with social progress and the principles of political science."

The law of the 19th Brumaire, which is in force to the present day, declares in

Article 5.—That the allowance of alloy in gold is limited to 3-1,000, and in silver to 5-1,000.

Article 8.—All precious-metal ware shall receive three distinct stamps; that of the manufacturer, that of the standard, and that of the Control Beaureau. And beyond these stamps for imported and plated ware.

Article 21.—That the stamp duty per hectogramme for gold ware be 20 francs, and for silver ware 1 franc, to which is added the cost of testing.

Article 13.—Precious metal ware imported from foreign lands must be shown to the custom house officers on the borders, who forward them to the next Control Bureau, where they are dealt with as the native produce. Exceptions to this rule are articles belonging to ambassadors, and which serve for the use of travelers; but in the latter case the weight must not exceed five hectogrammes.

Article 25.—For French gold and silver ware exported an export duty must be paid amounting to two-thirds of the stamp duty.

Article 47.—Every offieer, under pain of dismissal, is forbidden to give any description, either by word or in writing, of the precious metal articles in the Bureau.

Article 62.—The duty for testing the standard of gold ware is 3 francs each article, and for silver ware 80 rappes (a rappe 1–7 or a penny) each article.

Article 64.—For testing small gold ware with the testing stone, 9 rappes per deckagram.

Article 65.—If the testing officer suspects that the precious metal ware contains within it copper, iron, or other matter, he may, in the presence of the owner, cut it. In case of his suspicion being confirmed, the owner is fined twenty times the value of the article, which is also confiscated, and he is given over to justice. If, on the other hand, he is wronged by the supposition, the injury to the article is made good.

Article 71.—The precious metal manufacturer is bound to deposit his stamp with the proper authorities.

Article 74.—The precious metal manufacturer and tradesmen are bound to inform one of the officers in charge of the register of the weight, the number, the standard, and the kind of goods bought and sold.

Article 75.—Manufacturers and tradesmen are only allowed to purchase gold and silver of such people as are known to them, or for whom they will be responsible.

Article 78.—The same are bound to hang up in their sale-rooms the laws connected with the sale and standard of precious metal ware.

Article 79.—The tradesman in gold and silver ware must provide the buyer with the date of his purchase and the place of purchase, the quality or standard, and weight of the article, and also whether it be new or old. Regular forms are obtainable at the Regie de l'Enregistrement.

Article 80.—Anyone transgressing any part of these articles, commencing with 72, will for the first offence be fined 200 francs; for the second, 300 francs; and for the third, 1,000 francs; and will be deprived of the privilege of carrying on any further business.

Trade Gossip.

Pearls set in onyx are used for light mourning.

C. H. Hamlin, Marysville, has been burned out.

Silver and gold combs in filigree designs are much worn.

Lapierre & Brown, of Niles, Mich., have dissolved partnership.

A new design of sleeve button is a miniature folded newspaper.

Polished bone buttons, inlaid quaintly with silver and gold, are novel.

New silver combs are in the shape of a crescent and are delicately carved.

D. B. Bancroft, of Almont, Mich., is reported to have gone out of business.

Nancy ware, from the celebrated establishment of Gallé, is much sought after.

Osgood & Chapin, of Battle Creek, Mich., have been burned out. Insurance not stated.

Boule clocks, composed of wood and porcelain, are the latest Parisian novelties in timepieces.

Many beautiful designs in French marble clocks are to be found in our importing establishments.

Professor Watson and Ann Arbor, his wife, are happy. It's a boy planet weighing eleven pounds.

New opera glasses at Tiffany's are made with larger lenses than formerly, and the novelties are in shark's skin.

The offices of the members of the New York Jewelers' Association are to be connected by telephone with the main office.

Edward McGowan, a jeweler, at Charlotte Town, Prince Edward Island, was recently drowned by the upsetting of a sail-boat.

New designs in the celebrated Longwy ware are enriched with the most elaborate decorative coloring. They are very effective and popular.

An Ohio jeweler's wife has saved her husband from bankruptcy by gobbling up his stock by a judgment. The better half is now the best man.

A new design for a fruit dish at the Meriden Company's salesroom is a large hand-painted porcelain dish, supported by a high silver standard.

The Gorham Manufacturing Co. are producing some startling effects in decorative art-work in silver of Japanesque and Hindoostannee designs.

Silveroid is the name of a new alloy employed in the manufacture of table-ware. It is said to have a fine texture, and is susceptible of a high finish.

Messrs. Ve. J. Magnin, Guedin & Co.'s new building in Union Square is rapidly approaching completion, and will shortly be ready for occupancy.

Dr. J. S. Meyer, of Virginia, Nevada, has, as he thinks, discovered the long-lost Egyptian art of tempering copper so as to produce an edge that will cut like steel.

The trade is cautioned against a fraud going under the name of A. R. Little, and pretending to be a brother or connection of S. T. Little, of Cumberlend, Md.

The rage at the moment in Paris is for figures of a new French terra-cotta ware lately brought out by an noted ceramic artist for a enterprising manufacturer of faience.

A. Lounsberry's jewelry store, cor. Fulton and William streets, was recently entered by burglars. Fortunately, they were frightened off by an electric alarm, before stealing anything.

Mr. Sterling, of Leavenworth, Kas., has received a gold medal from the Kansas Agricultural and Mechanical Association of Leavenworth, for the construction of a novel clock.

Mr. Levison, of the house of Levison Bros., San Francisco, Cal., has returned from an extended European tour, He makes his headqu rters at the office of E. Howard & Co.

Messrs. Gunther & Co., of Toronto, have purchased from Messrs. Taylor & Bro. the old clock that for several years adorned the side. walk opposite their establishment in Bond street. The old timepiece was rescued at the time of the great fire that destroyed the Waltham building.

L'Epingle de Toilette is an ingenious novelty in the way of a brooch, which can be utilized as a lace pin, a braid pin for the back of the hair, a veil pin, or any other use to which a brooch can be put. They are inexpensive, and are made in a handsome imitation of tortoise shell and jet, variously ornamented.

Messrs. Matson & Co., of Chicago, deserve great credit for the stand they have taken in pushing the prosecution of their salesman, who, as it appears, has been systematically robbing them. Messrs. Matson & Co. have steadily refused to compromise the affair, and are willing rather to abide a loss than receive back stolen goods and let the criminal escape.

The "Talisman" is the name of a new bracelet which has just been patented. It is of varied and handsome design, and the idea is quite an original one, the bracelet consisting of a complete circle, without fastening of any kind. It is made in eighteen-carat gold, and is so elastic as to admit of being drawn over the hand and then fitting closely to the wrist.

The latest novelty in pottery, which originated in France, is a rough earthenware in imitation of that used during the sixteenth and seventeenth centuries. Its body is coarse and red covered with a bluish enamel. It is chiefly decorated in the renaissance style, and the pieces consist of inkstands, bon-bon boxes, and vases of grotesque shape, such as umbrellas, baskets and the like.

Poetic fans are coming into fashion in Paris. At the ball given by the Princess de Sagan to the Prince and Princess of Wales, the hostess presented each lady in the cotillon with a fan inscribed with a few verses of poetry. The fan given to the Princess of Wales was made of tortoise shell, and was ornamented by a crown and three cupids holding a scroll with an applicable acrostic.

The property formerly occupied by the American Sterling Company at Naubuc, on the Connecticut river, near Hartford, consisting of twenty-two acres of land, a large brick factory and outbuildings, an eighty horse-power Corliss engine, and all the machinery for the manufacture of sterling and silver-plated ware, has been sold under a deed of trust. The purchasers were James B. Williams & Co., who paid $19,900 for the entire property and fixtures.

We elsewhere publish an autograph letter of Dr. Oliver Wendell Holmes, rendering a graceful tribute to one of Messrs. Mabie, Todd & Bard's gold pens, which has been the constant instrument of one of the most distinguished literateurs of this country, and the point of which has traced many pleasant fancies and happy thoughts. Dr. Holmes' reputation is world-wide, and his endorsement and approval, based on long experience, and worded with peculiar felicity, must be very pleasing to Messrs. Mabie, Todd & Bard.

The following extraordinary announcement appears in a Western paper, offering Elgin watches as club premiums: "On account of low wages, and dullness of trade in the watch business, the publishers obtain these watches at much less than they have ever before been sold to dealers by the thousand, and they offer their patrons the full benefit of the reduced rates." It appears to us very unwise for the Elgin Company to permit the publication of such statements, which are calculated to alienate their best customers, and to destroy the trade of the country retailers.

The failure of Savage, Lyman & Co. is reported, with liabilities of nearly $500,000. They were the oldest firm in the jewelry trade in Montreal and have always stood very high in the estimation of the mercantile community. The immediate cause of the failure of the firm was the serving of a writ of attachment upon them, at the suit of Court & Mackintosh, official assignees, acting on behalf of Samuel & Buckley, of Birmingham, England, who are creditors for $70,000. The writ is for £10,000 sterling. Most of Savage, Lyman & Co.'s liabilities are due to English houses, and much of their stock of jewelry and articles of vertu consists of consignments from English firms for sale on commission. It is said to be doubtful if the estate will pay over fifty cents on the dollar. The embarrassment of the firm grew out of the general falling off in business within the last few years because of the hard times. All the members of the house of Savage, Lyman & Co. are highly respected, and have the warmest sympathy of the mercantile public in their present misfortune. Mr. Lyman and Mr. Hagar, partners in the concern, are both members of American families who settled in Montreal many years ago and engaged with success in mercantile persuits.

THE Jewelers' League continues to increase and prosper, while the officers are very careful in their admissions to membership. At the last meeting four new members were admitted, one application rejected, and three laid over for the next meeting, and another tabled until the general meeting. This proves the efficiency and caution of the Executiue Committee, and should encourage every member of the League to bestir himself to obtain suitable candidates. We are requested to call the attention of those contemplating an application to the necessity of giving full and detailed answers to the questions asked, replying plainly and emphatically, and further, signing the name in full where so requested on the blank.

Foreign Notes.

A 195 carat diamond has been found in the Kimberly mines. It was discovered by a native, who tried to conceal it in his blanket, but the eagle eye of the overseer was too sharp for him.

The Swiss exhibit of watches at the Paris Exhition is a decided success. There are 141 exhibitors, and among them are represented the Horological Schools of Geneva, Bienne, Chaux de Fonds, Fleurier, St. Imier, and Locle.

It is reported that the Japanese at the Paris Exhibition have purchased a large vase from Messrs. Tiffany & Co's exhibit. The vase in question is a specimen of the Mokamea, or imitation of the grain of wood in metal work. The manufacturer takes threads of gold and silver of varying thickness and hammers or rolls them into a plate of blackened silver so firmly that they form a very part of its substance. The plate is then rubbed down, and the surface shows a richly varied grain.

Mrs. Mackay, the wife of the owner of so many silver mines in Nevada, is a great purchaser of jewelry. She has recently bought a parure of diamonds, exhibited at the Paris Exhibition, consisting of a diadem, brooch and pendants, bracelets, rings and earrings. The parure is ornamented profusely with sapphires, and terminates with a handsome pearl. The center sapphire is valued at 200,000 francs, and the entire parure at 850,000 francs. She also bought a necklace of brilliants terminating in a drop, valued at 125,000 francs.

There is said to be a terrestrial globe in the Jesuitic Library of the Lyons Lyceum, which is 170 years old, containing, in great detail, the curious system of African lakes and rivers, which the English and American travelers have lately rediscovered. It is two meters in diameter, and an inscription, near the north pole, states that it was made in the year 1701, by F. F. Bonaventure and Gregoire, Brothers of the Third Order of St. Francis. The globe has created a great sensation among geographical savants and amateurs.

A general idea of the process by which MM. Feil and Fremy have succeeded in making real gems has been made public in Paris. The materials used are alumniate of lead and silica. The alumni is crystallized into white corundum, by exposing these substances to a rep heat for twenty days. To make rubies, a little bichromate of potash is added; to make sapphires, a little oxide of cobalt. The quality and beauty of natural gems are said to be reproduced in the precious stones thus obtained.

In the United States department of the Paris Exhibition is an ingenious machine for registering sums of money received, and giving a printed receipt, as well as maintaining a printed record, in columns ready for addition. There are seventeen keys, each beariffg a figure, and which, on being pressed, can imprint upon a card the sum received, while the same characters are also imprinted on a roll of paper out of the control of the cashier, in six columns for addition. The printed receipt card also bears the date, the signature of the house, and any other legend desired.

An attachment to the ordinary spring eye-glasses, by which they can at will be transformed into spectacles, and as quickly relieved from the attachment, is among the most recent and useful devices that have been brought forward. It was Dr. Cid, the well-known Paris surgeon who found that the spring eye-glasses injuriously compressed the arteries by which the nose is nourished, making that organ long and thin. The effect of this improved mechanism is to remove all pressure from the spring, and at the same time to hold the glasses firmly in position, and thus is avoided the irritation caused by a continual use of ordinary spring glasses, as in reading, writing, etc. The advantage of being able thus to convert at once the same lenses into eye-glasses or spectacles is obvious.

There is a clock in the Guildhall Museum, London, of which the motive power is hydrogen gas, generated by the action of diluted sulphuric acid on a ball of zinc. The clock itself resembles a large colored glass cylinder without any cover, and about half full of sulphuric acid. Floating on the top of the acid is a glass bell, and the gas generated forces forward this concave receiver until it nearly reaches the top of the cylinder, when, by the action of a very delicate lever, the valves become simultaneously opened. One of these allows the gas to escape, thereby causing the receiver to descend, and the other permits a fresh ball of zinc to fall into the acid. The same operation is repeated as long as the materials for making the gas are supplied, and this is effected without winding or manipulation of any kind. The dial plate is fixed to the front of the cylinder, and communicates by wheels, etc. with a small glass perpendicular shaft, which rises with the receiver and sets the wheels in motion.

Gold was discovered at Duriness, Sutherlandshire, Scotland, by Gilbert de Morava in 1245, and at intervals a sort of gold fever has been occasioned by the discovery of gold in that country ever since. In 1868 and 1869 there was a rush of people who expected to become suddenly rich by developing the gold deposits. But in 1868 there were only 577 ounces found, and the product dwindled down next year to 17 ounces.

Whether or no the golden objects which the peasant woman of Michalkoy found in a turnip-field are really the regalia of Cyrus the Great, still awaits answer. On what particular evidence Dr. Praglovsky, the archæologist who identified them, based his conclusion, information is still wanting; meanwhile speculation takes free range. *The Standard* (London) argues in this wise: "Cyrus, it is well known, died in battle. On the eve of the conflict he buried his treasure, and it has remained buried ever since. If gold to the value of thousands of dollars has been dug up in this barren and desolate land, whose can it have been? And if there be upon it the actual name of Cyrus, or even if it be marked with Persian characters, to whom can it have belonged but to Cyrus himself? What Persian commander, save Cyrus and Cyrus alone ever made his way to the waste shores of the Caspian with a treasure that a Peruvian Inca or a Burmese Emperor might well covet? Cyrus does not belong to the mythical age as did Hector and Archilles. He is far less mythical than King Arthur; he is almost as much matter of positive record as Alfred of Canute.

One of the novelties of the Paris Exposition is a drill which bores square holes, the invention of Mr. Julius Hall, of London. The work is done, too, says a correspondent of the *Scientific News*, in a way so simple and so easy that anyone may prove the fact for himself. The invention has excited genuine astonishment among the mechanics gathered at the Exposition. There is a constant crowd surrounding the inventor, watching him bore hole after hole square, and puzzling over the provokingly simple solution of the problem. All that is required is an ordinary dand drill stock. A stationary one with a chuck below for holding the work is used by the inventor; but he says a common brace will answer—"anything, in fact, will do that will properly hold the drill. The tool itself is the usual form of three-square drill, so that no special apparatus is required. Clamp or chuck this drill in its holder so that "it will wobble," that is the whole secret. Instead of making a round hole, as it will if tightly grasped, when loosely held it produces a square one; and, according to the inventor, it is immaterial whether the drill wobbles in the work or the work under the drill.

Mr. Fauvel, of Chefoo, communicates in the *North China Herald* some interesting facts concerning his researches into the mineral wealth of the district of Shantung and the curious means of collecting small diamonds by the natives. "These diamonds," he says, "varying in size from a millet seed to a pin's head, are procured from the glaziers, who buy them at the large fairs held every year at Chuchow, Laichow-fu, and Hwang-hsien. They are not to be found in shops, and are packed in quills. The manner of finding these stones is very curious. Men with thick straw shoes on go walking about in the diamantiferous sands of the valleys and streams of the diamond mountains, Chinkangling, some fifteen miles southeast of Yichow-fu. The diamonds, which are ragged and pointed, penetrate the straw, and remain there. The shoes are then collected in great numbers and burnt, the diamonds being searched for in the ashes. As is the case with amethysts and rock crystal in the Lao Shan, the priests of the temples in the Chinkang-ling are the principal dealers." Mr. Fauvel further mentions that a diamond as large as a pea had been brought to Chefoo and sold to a mandarin there.

On August 20th last the Society of Swiss Jurists met at the University, Geneva, Switzerland, to discuss the question of the adoption of a national patent law. Dr. Meili, of Zurich, who read the opening paper, took the ground that any patent law was unconstitutional, but advocated a change in the constitution, so as to permit the passage of such a law, and spoke of its many advantages. He also thought that an examination preliminary to the grant was advisable. Dr. Schreyer, of Geneva, followed with an elaborate address, wherein he warmly opposed a system involving such preliminary examination, admitting, however, the great desirability of the law itself. In the general discussion that took place on the questions presented by the papers, Mr. Morel, vice-president of the Federal Tribunal, and Mr. Francis Forbes, of the firm of Forbes & Sage, of New York, favored the adoption of the law, instancing the successful working of the United States Patent Laws, and the rapid growth of useful invention, owing to the security afforded by the same. At the close of the debate it was unanimously resolved that "the Society of Swiss Jurists declare that the passage of patent, trade mark, and design laws in Switzerland is desirable;" but the question was not voted on.

Workshop Notes.

A burnishing powder in use in Belgium is composed of ½ pound white chalk, 2 ounces pipe clay, 2 ounces white lead, ½ ounce magnesia (carbonate), and the same quantity of jewelers' rouge.

Re-sharpening old Files.—First clean well with scratch brush, then with benzine, see that the file is thoroughly clean, then place it in a bath of the following solution : One part acid, five parts sulphuric acid. Let it remain for three or four days or until the edges of the file are fully restored. Wash thoroughly with water to remove the acid, when the file will cut as good as when new.

A simple, sure, and excellent silver-test solution says a German contemporary, is obtained by dissolving kalium bichromaticum in water, with the addition of a little sulphuric acid, which gives the solution a blood-red appearance. Scratch the object with the stone and apply the solution; if silver a red sediment will remain; but if base metal, the coated parts will disappear or turn yellow. The testing stone must be well cleaned after using.

Precipitating Gold contained in old Toning Baths.—The baths when no longer fit for use are filtered into a white glass flask, rendered alkaline with a little bicarbonate of soda, and a concentrated alcoholic solution of magenta is added drop by drop until the liquid has taken the deep red hue of syrup of raspberries. The flask is then exposed for six or eight hours to the light of a bright window. At the end of this time the gold is found to be deposited as a violet powder, whilst the supernatant liquid has become colorless. It is carefully decanted, so as to preserve merely the deposit. When a sufficient quantity of protoxide of gold has thus been collected, it is carefully washed upon a filter, dried, and the filter is burnt. The dry residue and the ash of the filter is then dissolved at a gentle heat in an excess of aqua regia, and the solution (diluted with distilled water) is separated from the insoluble substances by filtration.—*Chem. Centralblatt.*

Mr. E. E. Bacon, a subscriber, contributes the following to *Workshop Notes.* We shall be glad if our other friends will follow his example. "I have seen from time to time in the columns of the Jewelers' Circular a method for grinding watch glasses. I herewith send you my way which will doubtless interest many of your readers. After making your arbor as instructed in the Circular, use a piece of glass instead of emery wheel, holding the flat surface against the edge of the watch glass, preserving the true bevel, and when ground sufficient, polish the edge with your rotten stone buff stock, and when done it will have the appearance of never having been ground. This method will never chip the edge. The glass method, given in the Circular, I use for grinding lenses. The glass will cut faster than the emery wheel. If an emery wheel *must* be used, fit it to a chuck and then throw it through the window and use one of the shattered pieces of glass in its place.

A correspondent of the *Deutsche Uhrmacher Zeitung* calls attention to the injudicious practice of blowing dust off of watchwork. He says that the operation looks so harmless that but few ever think of the destructive consequences attendant on the contact of humid breath with polished steel surfaces and springs. At lower temperatures a kind of veil covers the parts at once after blowing, which gradually disappears again, but it is in fact nothing else than a watery deposit, or steam reduced to water. Generally the deposit evaporates as the object gets warmer, but this is not *always* the case. Many watchmakers must have observed that polished steel surfaces are sometimes dotted over, apparently with particles of dust, which on closer examination are found to be rust. Perhaps many have been puzzled to account for rust spots between the coils of a spring, very minute, but still sufficient to render the article useless. These serious defects, says our authority, may in most cases be put down to the evil influence of warm breath, microscopic particles of water, for want of sufficient heat to evaporate, having remained on the surfaces and done the mischief described.

In the *Chemiker Zeitung* Dr. E. Ebermeyer gives a formula for gilding metallic so as to look like polished gold, by simply dipping them into a warm solution. Dissolve ten grammes of gold in forty grammes of hydrochloric acid and fifteen grammes of nitric acid; throw down the gold as fulminating gold by means of spirit of ammonia, filter and wash. In the meantime dissolve one hundred grammes of cyanide of potassium in as little water as possible, then dissolve the gold upon the filter with the cyanide solution. Pour this solution again and again over the filter until all the brown particles are dissolved, when the gilding solution is prepared by the addition of one litre of distilled water. Into this solution while warm, dip the metallic object to be gilded, and when drawn out it will have all the appearance of polished gold. The formula for silvering is as follows : Dissolve twenty grammes of silver in sixty grammes of nitric acid, and precipitate with a solution of twenty grammes of caustic potash in water upon a filter, and wash with water; now, redissolve upon the filter with a solution of one hundred grammes of cyanide of potassium in water; then dilute the whole to two litres with distilled water, and use like the gilding solution.

Watchmakers' brushes are a constant accompaniment to the watch bench nothing, except pliers, screwdriver and tweezers being in more constant use ; and how few use them properly, or, rather, how few keep them in proper use. A soft brush for rough work is quite useless, a hard one for fine work is ruinous, and a dirty brush of either kind is a nuisance. The methods adopted for cleaning them are nearly as various as the workmen that use them, and there are some who never even make the attempt. Some clean the brush with dry bread ; some lay a piece of tissue or other paper across the wide open bench vise, the sharp corners formed by the jaws taking off on the paper a little of the dirt; others vigorously brush a piece of clean cork ; and one man we knew used his knuckles for the same purpose. All these various modes are imperfect, and some of them very slovenly. The only good way to clean a brush is with soap and water—warm water being preferable if convenient. Wet two brushes, soap them, and then rub them together in plenty of water, and the job is done. The only objection to this way is the delay by drying; but this need not be be, for six brushes assorted will give you three clean ones to use while the other three are drying ; and the workman who cannot afford half a dozen had best seek some more lucrative occupation. More damage to the appearance of the movement is done by injudicious brushing than by any other means. The watch may not be injured in its quality as a time piece, but it grows prematurely old in looks by such severe treatment—*Revue Chronometrique.*

Very beautiful effects can be produced by giving tints to metallic objects or certain portions of them, and the following are some of the methods employed for that purpose : Metals may be colored rapidly by covering their surface with a layer of sulphuric acid in solution. According to the thickness of the layer and duration of its action, shades can be produced of gold, of copper, carmine, chestnut, brown, light aniline blue, and reddish white. All these colors are brilliant and if care has been taken to clean the metal before subjecting it to the action of the acid, they will polish very well. By dissolving 42½ grammes of acetate of lead in 225 grammes of water and heating the mixture to 88° Centigrade (190 4·5° Fahrenheit) or 93° Centigrade (199 4·5° Fahrenheit), it decomposes, forming a precipitate of sulphate of lead in black flakes. If a metallic object is plunged in that bath, the deposit settles upon it and a coloring is produced, generally of a reddish brown, the shade of which depends on the thickness of the precipitate. Care must be taken to heat the objects to be acted on in a regular manner, so that the color shall become uniform. Iron treated in that way assumes the aspect of bluish steel ; zinc, on the contrary, becomes brown. If, instead of the acetate of lead, an equal quantity of sulphuric acid is used, and the heat is raised somewhat higher than the degrees mentioned above, cannon bronze may be colored a magnificent red or green, very stable. Beautiful imitations of marble are obtained by heating bronze objects to 100° Centigrade (212° Fahr.) with a solution of lead, thickened with gum adragant, and afterward submitting them to the action of the deposit of acetate of lead mentioned above.

Business Notes.

Mr. T. Granbery has patented a black onyx locket of his invention which not only shows no gold except the edge of the enameled loop, but dispenses with the inner bezel. He is thus enabled to lessen the cost of manufacture and at the same time produce a very desirable locket for mourning wear.

Messrs. Hale & Mulford call the attention of the trade to their patented seal rings, an illustration of which will be found in their card elsewhere. These rings have been on the market for some time, and are highly spoken of by dealers as very desirable goods for fine trade.

Charles F. Wood, engraver and incruster of precious stones, is one of the best workmen in his line of business to be found in this city. Parties desiring his services would do well to communicate with him at his lapidary 169 and 171 Broadway, New York.

The attention of the trade is directed to the new clocks introduced by the E.N. Welch Manufacturing Co. of whom G. W. Brown, 32 Warren street, this city, is the agent. The movements are nickel plated and the cases, handsomely designed, are heavily plated with gold or nickel and are guaranteed to be accurate time-keepers and as fine in finish as any French clock. They mark an advance in American horology.

It is said that a curious clock is about to be introduced by the Ansonia Clock Company of New York. The dial, which to all appearances is of ordinary porcelain, becomes luminous when placed in the dark, so that the hands and figures can be plainly seen, and the time easily distinguished. It is the invention of a French chemist, and is thought to be imperishable.

Messrs Nicoud & Howard, of No. 14 John street, New York, are the sole agents in the United States for the tempered hair springs manufactured by Mr. Rivene Paquet of Geneva, which are recognized by the most eminent adjusters in Switzerland as the best hairsprings made. These have only recently been introduced into this country and merit a trial by first-class watchmakers.

We would direct the attenion of the trade to the advertisement of Messrs. Reed & Barton, who display a very beautiful pattern of fork, that will doubtless become excedingly popular. This enterprising firm is constantly introducing new and artistic designs throughout the entire lines of plated-ware which was never more attractive than at the present time.

H. C. Haskell & Co., of John street, New York, present in this number a sheet of very handsome novelties in rings, exhibiting the newest designs and patterns and will undoubtedly attract the attention of buyers. Intending purchasers can order intelligently from this sheet by observing the numbers of each design and communicating with the manufacturer.

Mr. James Annin, of Leroy, New York, has patented a combination napkin ring and holder, which not only retains the napkin when folded up but forms a clasp which secures it to the neck of the wearer when seated at table. The invention consists in forming the ring of two or more pieces jointed to each other, the combined length of which, when extended, is sufficient to partially or wholely encircle the neck of the wearer.

The Archer & Pancoast Manufacturing Company present in this number an illustrated sheet of designs at once novel and effective. On it are represented sconces and fancy candelebra, which are now manufactured in polished brass, in accordance with the dictates of popular taste. This plate has been specially designed for this journal by the Graphic Company of this city, and is an admirable example of the excellence achieved by this well-known establishment.

Mr. LeRoy W. Fairchild, the well known maker of gold pens and pencil cases, is introducing many attractive novelties which will compel the attention of the trade. He has recently brought with him from Europe the latest patterns of the old world and improved upon them. He is now introducing new designs in porcelain and antique enamel decorated with figures, also beautiful designs in frosted silver Japaneze work, and in the peculiar damask finish so much admired in the Russian exhibit at the centennial. A pencil case floricated in diamonds, rubies, and other precious stones is indeed a work of art worthy of calling. These goods are very beautiful and reflect great credit upon the observation and taste of the maker.

Le Boutillier & Co., of Union Square, offer a very handsome assortment of French clocks, bronzes, &c., including late novelties from Paris. Their stock comprises all styles and patterns, from the very expensive to goods suited to the modest means of popular trade.

The Gorham Manufacturing Co. are represented in this number by four pages of designs in decorative silver. These are quite new and fully sustain the honorable reputation of this famous firm, which for fifty years has occupied the foremost position in this country as working silversmiths. A study of their design and a perusal of their announcement elsewhere should not be neglected by those members of the trade whose object is to secure first-class goods and keep up with the times.

Messrs Aikin, Lambert & Co., of 23 Maiden Lane, this season introduce to the trade their "Novelty Tray," which consists of a tasteful assortment of the newest things of the season in this line of goods. These novelties are very taking and original; among these we would specify the following as strictly noteworthy:—the cartridge magic pencil or watch-key, the cartridge locket set with real stone or intaglio, the celluloid oval pencil or watch-key with compass the nickel magic cross charm pencil, the imitation ball chain magic pencil and imitation shell chains and lockets. These goods merit the especial attention of buyers.

Messrs. Kossuth Marx & Co., of No. 39 Maiden Lane, New York, offer to the trade this season many novelties both in gold and fine rolled plate jewelry, and direct special attention to their large assortment of rings set with diamonds, pearls, cameos, amethyists, garnets etc. This firm is the only one in this country which manufactures silk guards, and has lately perfected new designs in which the silk is finished with mountings in gold, silver, and plate, so as to form a very stylish and tasteful article especially suitable for high-toned customers.

Messrs. Hall, Nicoll & Granbery, who have succeeded to the jewelry and fancy goods department of Messrs. Schuyler, Hartley & Graham, display an elegant collection of high class bronzes at their artistic store, No. 20 John street. They also offer a very fine line of clocks in all grades and styles, from the cheapest to the finest made. The bronze department has been thoroughly fitted with everything that artistic taste can suggest, and is now one of the handsomest to be found down town, while the entire establishment is in keeping.

We would call the attention of the trade to the American Pedometer just put upon the market by Messrs. Tiffany & Co., who are *sole agents* for the makers. It is an accurate recorder of the time and d stance walked by the person carrying it, is strong and durable, in a nickel-plated case, the size of a small watch, and retails for *five* ($5) *dollars*. It is a simple piece of mechanism, readily adjusted by anyone to any length of step from 23 to 35 inches, cannot easily get out of order, can be carried in the vest pocket, and is a true indicator of the amount of walking exercise either in or out or doors.

The Langen-Otts Atmospheric Gas Engine has long been recognized as the most convenient and effective motor in use. Heretofore, however, the working was far from noiseless, but this disadvantage has been obviated and the new silent engine on exhibition at Paris has attracted much attention and been awarded high commendation. The construction is simple, the running silent, smooth and regular, and the engine is being rapidly adopted by practical workmen. The facility with which the engine is started, when power is wanted or stopped, after the work is done, and furthermore, the precise regulation of the gas consumption in proportion to the power developed, which is effectual in this engine by a very sensitive governor, are all points of importance for its economy and its conveniences. The American patents relating to this invention are controlled by Messrs. Schleicher, Schumm & Co. of Philadelphia, and the Silent Gas Engine has already been set up by them in various places in this country.

Henry C. Jacot, of St. Louis, Mo., has patented an improvement in regulating attachments to pendulum balls. It consists of a dial pendulum ball the face of which is marked with lines corresponding to minutes: there is a hand attached which is to be moved toward the words "fast" or "slow" as required to make the clock move faster or slower. The hand can be moved as many minutes as may be necessary to counteract the irregularity of the clock. By this device there is no more guess-work in regulating clocks, but the repairer can do in one day what usually requires several days or even weeks. It is so simple that a child can manage it, and there is no complicated machinery to get out of order. It does away with the nut screw which is so liable to get misplaced by accident, and is, furthermore, quite ornamental. We have no doubt but it will become popular as it becomes known, as it is a great saving of time and annoyance in regulating clocks and keeping them in order. F. Kroeber, of No. 8 Courtlandt street is the agent for this desirable improvement, and is introducing them in his exposed pendulum clocks without extra charge.

THE

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THE

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THE RECOGNIZED ORGAN OF THE TRADE.

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ADVERTISING RATES MADE KNOWN ON APPLICATION.

AGENCIES, { J. H. PURDY & Co., 170 State Street, Chicago.
PRATT & Co., Ninth and Arch Streets, Philadelphia.
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FREARSON BROS., Adelaide, Australia.
T. T. JONES & SON, 330 George Street, Sydney, Australia.

Our Success in Paris.

AMERICAN manufacturers covered themselves with glory at the Paris Exposition, surpassing by far the most sanguine expectations. That this country was represented there at all is due to the indomitable perseverance of our people, in the face of the greatest amount of discouragement that Congress could throw upon the project. While other nations heartily endorsed the plan of the Exposition, and, at the earliest possible moment, gladly availed themselves of the courtesy of France to participate in this greatest of world's fairs, our Congress refused to consider the proposition, or to make any appropriation to aid our citizens in entering the competitive lists against their foreign rivals. It was not until almost the last hour of the session this spring that Congress yielded to the importunities of the press and the people, appointed commissioners, and gave the use of vessels to transport the goods of exhibitors to Paris. The appropriation thus grudgingly made was but a pittance of the sum required to give us such representation as would be worthy of the nation, and the time granted was wholly inadequate. Under the circumstances, it was hardly to have been expected that any very large share of honors of the Exposition would fall to American exhibitors. But the indomitable Yankee is not to be suppressed either by home discouragements or foreign rivalry. The result shows that Americans held their own at the Exposition, receiving 10 grand prizes, 30 diplomas of honor, 134 gold medals, 200 silver medals, 220 bronze medals, and 156 honorable mentions. The aggregate is larger than the whole number of American exhibitiors at the Paris Exposition of 1867, or at the Vienna Exposition of 1873, and is a larger proportionate award to exhibitors than to any other nation represented at this Exposition.

The awards were made on the 21st ult., by President McMahon, in the presence of the many crowned heads and representatives of European royalty, and an immense crowd of spectators. A number of Americans were decorated with the ribbons of the different grades of the Legion of Honor. Mr. Richard C. McCormick, our Commissioner, being invested with the rank of commander, others being made officers, and still others chevaliers. Among those who received this distinguished honor was Mr. Charles Tiffany, of the firm of Tiffany & Co., the well-known jewelers of this city. Tiffany & Co., received several prizes, also, for the goods exhibited by them. One of these was the grand prize for art work, in silver and other metals, this being the only grand prize awarded to American jewelers. They received in addition for other exhibits two gold medals and two silver medals.

The following is a list of prizes awarded to American manufacturers connected with the jewelry trade:

Grand Prize.—Tiffany & Co., New York; art work in silver and other metals.

Gold Medals.—American Watch Company, watches and watch movements; Leroy W. Fairchild, gold pens, gold and silver pencil cases, etc.; E. C. Moore, collaborator of Tiffany & Co.; Tiffany & Co., art work in silver and other metals.

Silver Medals.—Aikin, Lambert & Co., gold pens, cases, pencils, horse timers, etc.; Bausch & Lamb, optical instruments, eye glasses, magnifiers, etc.; Seth Thomas Clock Co., tower, church, house and marine clocks.

Bronze Medals.—Ansonia Clock Co., clocks and movements; Dimes, collaborator of Tiffany & Co.; Hagstoz & Thorpe, watch cases plated with gold; P. Hartmann, filagree silver jewelry; Keller & Co., collaborators of Tiffany & Co.; J. H. Knapp, gold pens, pencils, etc.; James Morton, pens, pencils, etc.

Honorable Mention.—Bliss & Dean, jewelry, lockets, etc.; S. E. Fisher & Co., gilt jewelry; F. Kroeber, fine walnut case clocks; H. Muhr's Sons, gold rings and lockets; Young & Bennett, gilt watch and neck chains.

It will be seen, therefore, that the jewelry trade of America contributed its fair proportion towards the success of the Exposition of 1878, and, in return, secured its full share of the honors. Some of the best specimens of workmanship of our jewelers, Mr. Hartmann, for instance, sent out in a government vessel, did not arrive until after the judges had passed upon the classes in which they were exhibited, and consequently they were not considered. Had it not been for the stupidity of Congress, which failed to recognize the importance to American industry of this Exposition the number of American exhibitors would have been largely increased. This would have been a large stimulus to trade, placing our industries in direct competition with those of Europe for the patronage of the world. How well we should have fared in such a competitive exhibition is indicated by the large number of prizes secured by the few who participated.

Overstocking Retailers.

WE have heretofore warned retail dealers against buying more goods than they really require, and also against striving to force a market for goods not suitable to their locality. Many a man owes his failure in business to an attempt to carry a larger stock of goods than was necessary, and, being unable to dispose of them, was unable to meet maturing obligations, and failure and ruin were the result. Close buying and quick sales are prominent factors

in the problem of conducting a successful business. But, as it takes two to make a bargain, the retailers are not entirely to blame for getting overloaded with goods. The manufacturers and jobbers share the responsibility with them, for they, in their anxiety to dispose of their goods, press them upon the retailers with such pertinacity that to refuse to take them would seem like giving personal offence. Let a country dealer come to New York for goods, he is at once besieged by a set of irresponsible drummers, for cheap houses, urged to buy without stint and regardless of future payments. He is told that his paper will be extended from time to time, and he need give himself no uneasiness about it. He is flattered and cajoled until, in many instances, the victim is really made to feel that he is an important personage—he must be, when manufacturers and jobbers quarrel with each other to see which shall give him the greatest amount of credit. Of course the legitimate dealers do not go to such excess as this, but the city is full of drummers for out-of-town manufacturers who lie in wait for victims, and are prepared to load them down with goods of all kinds. Even with our oldest and best known houses, competition is pushed to the verge of recklessness, and the responsibility of the customer is crowded to the last extremity. A man's credit may be good for $5,000, and, if encouraged properly, he may be able to meet his payments promptly; but load him down with $10,000 of indebtedness, with no assets but an unsalable stock of goods, and his responsibility is destroyed. Ordinarily a man will ask credit to the full extent he should receive; to urge him beyond that is to imperil his interests and the intersts of all his creditors.

But beyond this, the overloading of one customer is likely to interfere with the legitimate trade of his competitors in business. As his maturing paper stares him in the face, he is liable to sacrifice his stock rather than to let it be protested. He begins to undersell his competitors, sacrificing both his own and his neighbors' goods, and ends, perhaps, by driving both to destruction. Then there are compromises with creditors and the market is stocked with goods for which the owners have paid but 20 or 30 cents on the dollar. Legitimate trade cannot compete with business of this character. Retailers are constantly complaining of the irregular manner in which goods are placed on the market, and blame the manufacturers and jobbers for it. They insist that a reform is necessary in the matter of credits, and only those encouraged who can sell what they buy and pay dollar for dollar all the indebtedness they incur. Credit is necessary in our mode of doing business, but there is some limit to it in every case, or, rather, there is a limit to responsibility. To urge a man to purchase beyond the limit of his responsibility is an injustice to him and to all his creditors. The end of the year is approaching, when men in the jewelry trade are in the habit of balancing their books. While the year's work will, doubtless, show an improvement upon that of last year, the bulk of profits will not always be found to lie with him who hao sold the most goods, but, rather, with the one who has made the fewest losses. It is a pleasant thing for a man to say, "I sold a hundred thousand dollars' worth of goods this year," but, if he adds, "and I didn't make a cent," it does not speak well for his business tact and discernment. But if he sold half, or quarter that amount, and can show a small margin of profit over all expenses, he is to be regarded as one of the fortunate ones. It is the losses in business which have made the hard times in the jewelry trade rather than scarcity of business. Establish credit upon a fair basis of responsibility and the leaks will be stopped and the balance transferred to the right side of the ledger.

Commercial Travelers and Drummers.

WHILE in the public mind there has grown to be much confusion as to the meaning of the terms, there is, nevertheless, a very great difference between the commercial traveler and the drummer. The one is a necessary medium of legitimate trade, while the other is a public nuisance. A commercial traveler is a person who represents a responsible house, manufacturers or jobbers, and travels from place to place, visiting the clients of his employers, exhibiting samples of new goods, and receiving orders for them. He is a responsible, respectable gentleman, conversant with the trade in general, representing his employers as loyally as though he were a member of the firm, and, at the same time, carefully and zealously guarding the interests of his customers. His coming is looked forward to with pleasure, as it enables the dealer to replenish his stock easily, and saves him the expense of a long tedious journey to the eastern cities. The commercial traveler is a recognized "institution" in this country, although of foreign invention. He first made his appearance, we believe, in England some forty or more years ago, and, although scattered in later days to the four quarters of the globe, his usefulness has not departed from him. He is a legitimate salesman for a legitimate business, his field of operations being "on the road" instead of behind the counter or in the office.

The drummer, on the contrary, although aping the manners of the commercial traveler, is a pest to the trade. He announces his coming in advance of his swooping down upon the country dealers, who, instead of being overwhelmed with joy at his prospective arrival, strive to make it convenient to go fishing about that time. The drummer has no regular customers, but, sailing under the piratical black flag, pursues and captures if possible every craft that is likely to bring him a profit. He represents all lines of goods, of a debased quality, and glories in selling another dealers' customers, if that be possible. A jewelry drummer invades a town, and, sample box in hand, visits every person in any way connected with that industry, using every argument to induce them to buy from him. He uses evey point in the tactics pursued by his comrades who swarm about the New York hotels, or lay in wait for victims around the entrances of respectable houses in Maiden Lane or John street. The goods he offers seldom have the guaranty of a respectable manufacturer, but are of that class that are made to deceive. After selling all the goods he can to dealers, the drummer retires to his hotel, and displays his wares to all comers, selling at retail to individuals for the same, or even a lower price than he had sold to the regular retailer in the same town. We have known this to be done repeatedly in western cities. The drummer usually makes a point of paying his hotel bill from his sample box, and not unfrequently makes a trade with some "ticket scalper" for his railroad tickets. "Cheek" and "the gift of the gab" are the essential requirements for a successful drummer. The gentlemanly instincts and business integrity which characterize the commercial traveler would be lost upon the drummer, and do not enter into his make-up. Conscience in his organization is only noticeable because of its absence. It is unfortunate that a respectable calling, like that of the commercial traveler, should be disgraced and brought into disrepute by this drummer fungi that attaches itself to it, and almost overwhelms it, as rank and poisonous weeds sometimes choke out and destroy a valuable crop, but it is inevitable. It is still more unfortunate that the public fails to recognize the legitimate from the illegitimate. The only remedy for the evil lies in the repudiation of the drummer by all legitimate retailers, and the encouragement of the commercial traveler.

Insurance Protection.

IT is a matter of considerable importance to the creditor class of the community to know how the debtor class is protected against loss from fire. Prominent insurance authorities estimate the annual losses by fire in this country alone at $100,000,000, and that fully 33 per cent. of this is the result of incendiarism. The cause of incendiarism is over-insurance, which tempts the greed of man. When a man can insure a $3,000 stock of goods for $10,000 at the prevailing low rates, finds trade dull, and profits infinitessimal, the temptation to set fire to his premises is found by many to be irresistible. They are usually careful, however, to remove to a place of safety the most valuable part of their stock, but to collect the insurance as though all had been destroyed. The fact that a man has been burned out gives him

an apparently valid excuse for seeking a compromise with his creditors, and if, under the circumstances, he offers 20 cents on the dollar, he is considered to have acted in a highly creditable manner. With the bulk of his insurance money in his pocket, and the goods which he had secured from the flames, the unfortunate "victim of a disastrous conflagration" is ready to start in business again. Cases of this kind are by no means visionary; they are occurring every week, as the insurance companies can readily testify.

But, in addition to the risks thus assumed by the creditor class, there are those which they incur in their dealings with honest men. Goods sold on credit are naturally an object of solicitude to the seller. If they are sold, he is tolerably sure of getting his pay for them; if they are stolen or destroyed by fire, his chances of getting paid are materially lessened. It is of much importance for business men who give credit to know what means are at the disposal of the debtor to protect his property from fire. There are many towns in the country, having from 1,000 to 5,000 inhabitants, that are absolutely without any means for extinguishing fires, having neither a public water supply nor fire engines. Insurance companies are chary of taking risks under such circumstances, and manufacturers and jobbers should be equally opposed to selling goods to retailers doing business in such localities. If it is essential for insurance companies to inquire as to the means a community has for fighting fire, creditors whose goods are exposed, should certainly adopt similar precautions. In these days of many conflagrations, the risks to which goods are exposed to destruction by fire are such as the creditor class cannot afford to overlook.

An Important Decision.

A VERY important case to importers of jewelry has lately been decided by the United States Circuit Court in this city, which determines as to what constitutes "jewelry" for the estimation of duty. J. Rosenthal & Co., of this city, had imported an invoice of studs, sleeve buttons, etc., made in vegetable ivory, steel, pearl, and rubber, and sought to enter these goods as "jewelry" at a duty of 25 *per cent. ad valorem.* The appraiser, however, considered that the articles were not entitled so to pass, and classed them as "special manufactures," liable to 35 *per cent.*, a decision which was approved by Collector Arthur. Messrs. Rosenthal then brought suit for a rebate of the ten *per cent.* additional paid as aforesaid, and the case came on to a trial before Judge Shipman and a jury. The matter in dispute was a simple question of fact, as to what constituted jewelry. The verdict of the jury establishes that precious metals and precious stones alone should be so charged, and this decision will be authoritative until reversed. Hence all imitation goods will have to pay thirty-five *per cent.*, and thus the ruling in question is of widespread importance. It must be remembered that the case in point was determined upon the evidence presented to that particular jury, and it is claimed that the government case had been supported by the testimony of men interested in high price jewelry, and that in the event of another trial different testimony could be adduced with very different results. The point in dispute is very impor ant, and can scarcely be regarded as finally disposed of by the case of which mention is now made. The matter will probably be brought up for argument, and if a rehearing is obtained will be presented on further and other evidence. Meanwhile the importers of imitation goods will be heavily taxed with an extra ten *per cent.*, which they may rest assured will be rigidly enforced whenever an opportunity exists.

The First Death Loss of the League.

WE have again and again urged upon the consideration of the trade the manifold advantages of securing membership in the Jeweler's League. To-day we have to advance the sad but conclusive argument inculcated by the death of a member. Mr. Charles Wm. Menge, of 34 John street, in this city, was well and favorably known to the trade. Some years ago his father, Charles Thomas Menge, died and his widow kept the business together until the son was competent to succeed the father. In due time he did so, and although young in years, was well esteemed by his business associates and social friends as a rising young man, sympathetic in temperament, devoted to his business, attentive in the home circle and genial among his many friends. He was one of those most deeply interested in the organization of the Jeweler's League, and his membership dates from the 1st day of June last. Since then he has worked well and perseveringly to insure its success, and only the other day he spoke of the increased membership which would result if a member should die. His words were sadly prophetic, for he himself was destined to be the first to be called away from the fraternity of the League. To-day he lies cold and spiritless, but his voice, though hushed forever, speaks in still more unanswerable accents, urging those who have not made preparation for the future to do so without delay. Life is uncertain, but death is sure, and we should take good heed that provision is made for those who are near and dear to us. Mr. Menge was only 24 years old, when an allwise Providence called him from his sphere of earthly labor. He was a good son to his widowed mother, and was just about occupying the place formerly honorably filled by his departed father. Now he has been taken away, but his afflicted mother will find substantial evidence of his filial affection when she receives the willing tribute of the Jeweler's League.

Savage, Lyman & Co.

WE are in receipt of advices from Montreal announcing that the assignee's statement in the Savage, Lyman & Co. case shows liabilities amounting to $121,000 and assets of $87,600, made up as follows: Stock $74,000, good debts $12,000, doubtful debts $1,200; the deficiency, therefore, amounts to $33,400. An offer of 35 cents on the dollar was submitted to a meeting of creditors, but was not accepted. Mr. R. R. Grindey, of the Bank of British North America, Mr. Buckley of Birmingham, and Mr. Alfred Savage of Montreal. have been appointed as a committee to investigate and report.

This case of Savage, Lyman & Co. is somewhat peculiar in some of the circumstances and merits the attention of the business world. The firm have the sympathy of all their friends and creditors, and it is admitted that the business trouble which has overwhelmed them is untainted with the faintest trace of anything savoring of dishonor. The house was believed to be doing a large and remunerative business. Yet on examination it is found that the very extent of their business only precipitated their existing condition, for now that profit is at a small margin they actually lost more in proportion with the increase of their sales. This problem is explained as follows: Mr. Savage, the founder of the firm, bought his goods through the firm of Bolton & Buckley, of Birmingham, England; allowing the latter, enquiry being made by the Montreal house as to how the Birmingham account was made up; the statement being received as correct, in compliance with the customary feeling between houses of long time business relations. At length, however, inquiry was made, when it was found that interest was being calculated on every cent of indebtedness, both actual and honorary, at 10 per cent., and made up every six months. The consequence of this is that Buckley & Son (successors to Bolton & Buckley) figure on the schedule for $75,000, which sum, it is said, does not represent a dollar's worth of goods, but is made up of 10 per cent. purchasing commission and 10 per cent compound interest made twice a year, while a very large amount is a purchase commission of ten per cent. and ten per cent interest. Here was a load of twenty per cent. to be carried right along. Perhaps in those days, when competition was unknown and profits unlimited, Mr. Savage was justified in working under so serious a burden, at any rate when he became involved frum other causes he paid 74 per cent. of his existing liabilities, and pledged his word for the balance. After his death, his widow, bound by a like sense of honor to that which had animated Mr. Savage. arranged to remit from time to time on account of balance still due, and when her interest was

bought out by Mr. Theodore Lyman, he assumed the remaining liability. Accordingly remittances were made to England without any due alone upon the balance of Mr. Savage's indebtedness, which had no legal obligation save the honor and rectitude of the man. It is pretty hard for Mr. Lyman to be saddled with such an incumbrance as this. He worked hard, has lost most, but is still anxious to do the best he can for all his creditors. We understand that Mr. Buckley represents large European interests, and we trust that he will see that the enforcement of his claim will be injurious to all. Mr. Lyman stands well with the trade, and a bright future lies before him. He will assuredly re-enter business and re-occupy a leading position. In a case like his, every effort should be made to help him out, and hard bargains should be released. If Mr. Buckley stands by the strict letter of his claim, he may rest assured that his conduct will be remembered both here and in England. If on the other hand he should advocate reasonable indulgence to the man who has broken down in attempting to labor for his benefit, he will find that the re-established firm will not be lacking in right minded gratitude.

The Gold and Silversmiths' Work at the Paris Exposition.

Translated from the "Gazette des Beaux Arts" for the Jewelers' Circular.

CHARLES ROSIGNEUX exhibited at Vienna furniture set with gems which created a sensation, and in which, as in the Vatican Library, we are led to ask where do the functions of the goldsmith begin and end? The architect is inventor and master worker, he has made two important examples of an art which is quite modern, endowed household effects with a novel wealth of bronze, silver, gems and enamel and offered to the goldsmith a more interesting field of labor than adorning tables and sideboards.

It is intended that the Vatican Library shall contain all the marvellous translations of "The Ineffable Bull." The Abbe Sire, after eighteen years of incessant toil translated the dogma of the Immaculate Conception into every language spoken on the globe, and this proclamation of Pio Nono has been transcribed simply or elaborately into the uncouth accents of different nations, the dialects of the provinces, and the languages of Europe, and illuminated with valuable paintings in minature. These manuscripts were enclosed in fitting bindings, many of which are very notable, and the books have found a fitting depository. The zeal of the faithful has defrayed the cost, and the lowly priest of Saint Sulpice has worked a two-fold miracle, he has reversed the incidents of Babel and tuned the strangest tongues to the same chant of love, and has succeeded in the creation of the most sumptuous article of furniture in this competition of the arts and industries.

It is an immense cabinet, six metres long, sustained by thirty-six feet with capitals, in graved bronze with intervening girders of the same metal, and surmounted by a statue of the Virgin of Lourdes in ivory and silver. Glass panels, sloped in a desk, protect the manuscript; a long band enamelled in *cloisonne* with garlands of eglantines encircles the table, while the frieze represents the nations of the world bringing in triumphal procession to the head of the church scrolls inscribed with the various titles of honor accorded to the Virgin. We have not space to speak in detail of the graving, the fine sculpture, the gentle charm of Mr. DeCourcy's hands, but while rendering a word of praise to M. Reiber, the architect designer, we must say that the supports made the profile appear angular, and the outline heavy. Some of the details are charming, but others, such as the votive medallions of the lower frieze are somewhat queer and bad. But such a work should only be criticised in its place in the Vatican, where this depository can only be properly appreciated in the hall which is reserved for it.

Let us now consider the introduction of Japanese taste into our fashions, which within the past ten years has so materially modified our ideas of decoration. Whether its influence be for good or ill, MM. Christofle and Bouillet were the first to adopt it, and with them M. Reiber, the high priest of Japanism, is to be found. Many other artists have been converted to his doctrine, and this method has invaded china, crystal, furniture, stuffs and fancy paper. Wonderful to say, it has even influenced sculptors, as witness the two graceful candelebra in beaten bronze modelled by Guillemin, but Reiber has caught the true key, he keeps to the happy mien in this art which is still a mystery to be handled with care, and his paraphrases belong to our time as the Chinese fantasies of Bouder to the French taste of the last century. M. Reiber has pitched the key note for Japanese pottery, and has attuned metals and enamels by proper toning. Shall we describe the vases enamelled by Tard after his designs. Shall we describe the *cloisonné* work which now equals the best examples of China? Shall we speak of the chalices, lamps, caskets, flower-pots, candlesticks, which, perhaps by the tints of enamel, perhaps by the everchanging workings of bronze incrusted with gold and silver, attain such intensely powerful effects of varied decoration. Such is the peculiar quality of this new art which comes to us from the far Orient, and since we have named Tard, the artist in enamel, we must mention Guignard, one of the most valued assistants of Christofle, the creator of some of the best works in forged metal we know of.

The house of Tiffany, of New York, justly merits special attention. He has been inspired by Japanese models, and having studied Japanese methods at Philadelphia, two years before a like opportunity was afforded to Parisians, who has profitted by the advantage thus afforded. He refrains from enamel and from the delicate and fantastic chasings of Karasawa and of Takaota; but he has adopted the features found in broad and free designs, such as foliage plants, birds and fishes, and has above all mastered the secret alloys. He has imitated to perfection *mokonwi*, a combination of gold, silver and copper, soldered and forged in threads and layers, so as to imitate the grain of wood, as is expressed by the native word; *chakouda*, an alloy of bronze and gold, which presents a sombre tint, and *sibouili*, a grey alloy. Russian *niello*, fine copper, gold and silver complete—this novel pallette of the goldsmith with which this American artist achieves varied effects, which are not affected in constancy of color by chemical reagents or continued usage. This is a new departure, nor is it the only one. Tiffany has applied these decorations to practical, sensible and simple designs. He has retouched silver surfaces with light, but regular strokes, imitating contours with the die-hammer instead of the lathe. The result is exceedingly pleasant to the eye, while the beholder is not afraid to put his fingers on the polished surface, no longer hard and cold, while pores and wrinkles of skin, fibres of foliage, and the bloom and grain of fruit are wonderfully reproduced, and connoisseurs must needs admire the charming novelty which is only a return to primitive methods. Moreover, Tiffany astounds us by the cleverness of his chasings. One tea service modeled after the Indian style in silver, and covered with flowers in *repousse* work is a masterpiece, the Bryant vase is distinguished by important merits, and the Sioux and Delaware figure pieces compare favorably with those formerly modelled for Count Koncheleff by Emile Carlier, and which have been fairly reproduced by him whose chasing is, however, inferior to that of the American artist. Finally, nothing would be finer than the engraving on the dinner set exhibited by the New York firm. Now that Heller has gone to the United States, who in France can cut as perfect dies?

We need not delay long over the Elkington exhibit, although the house ranks in England as Christofle does in France. The *cloisonné* enamels of the former are but a weak repetition of those of the latter, and although possessed of solid merit, suffer from the graver fault of lacking individuality. As it is our intention to deal solely with artistic merits in this article, we need only mention the good work done for the Elkington by M. Morel-Ladeuil, who in company with M. Willms exercises an important influence on the fabrics of London and Birmingham. Their rooms are familiar to amateurs, and we have already admired in the Salon the handsome Helian Vase. The Pilgrim's Progress shield, a new work, the subject of which is taken from Bunyan's mystic legend, is but a weak adaptation of the Paradise Lost shield, which was designed by Morel-Ladeuil, and now possessed by the Museum at South Kensington.

Practical Hints on Watch Repairing.

By Excelsior.—No. 44.

EXAMINING THE DETACHED LEVER OR "ANKER" TRAIN.—CONTINUED

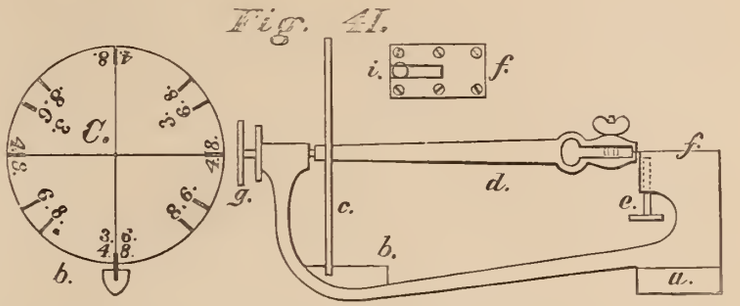
(686) *The Barrel Arbor.*—When the ratchet wheel is a part of the arbor, it is called a *solid ratchet arbor;* if the ratchet is a separate piece, it is then termed a *loose ratchet arbor* or *plain arbor.* The hollow in the main wheel bridge, in which the ratchet wheel rests, is the *ratchet sink.* The piece which goes over the ratchet wheel is called the *ratchet cap* or *cover*, when it covers the entire wheel; but if not, it is called the *ratchet bar or strap.* There are also the *winding arbor cup*, surrounding the *square*, to catch the dirt; and the *arbor nut*, either pinned or screwed on the arbor, inside the barrel, on which is the *arbor hook* for the inner end of the mainspring. The click which works in the ratchet wheel teeth is of several different forms. There is the *loose click*, with the *click spring* to hold it to its place; also, the click and spring in one piece, called the *spring click*, which may be a *straight click*, a *curved click*, a *circular* or *self acting click*, or a *slit click.* On the lower end of the arbor is a square for the stop work, called the *stop square*, as the upper end is the *winding square.* The stop wheel on the arbor is the *male stop*, with its *finger;* the other wheel is the *female stop*, sometimes called the *star wheel.* A plain arbor has its lower extremity, below the male stop, formed into a pivot, which is supported by the *barrel cross bar.* Each of these parts has its special screws, called after it, as the *the main wheel bridge screws, rachet cover* or *bar screws, click screw, click spring screw, stop screw, cross bar screws.*

(687) We first notice if the winding square is sound and perfect; should the corners be worn off, the square should be filed up. If it is quite short, and is not squared down to the rachet, it should be made so while filing it, in order to have as long a hold for the key as may be. In the case of a loose racket wheel, if the square does not fit the hole in the wheel well, a new wheel had better be fitted, as no dependence can be placed on the action of the click in the ratchet when the latter is "shucking around loose." The tip of the square should be polished, but the sides are better left as they come from the fine file, or from the lap with oil stone dust, called "in the gray," especially if the square is short, as the key is much more liable to slip off from a polished square. On the other hand, they should not be left too rough, or dirt will stick to them, and they will be more likely to rust, than smooth ones. Some workmen leave the sides as they come from the coarsest or roughing file, with deep furrows across them. This is worse than polished sides, being very unsightly, with great danger of snapping off the square in winding, if it is properly hardened. A much-tapered square should never be allowed, but should be filed the same size from the tip to the shoulder, or so nearly straight that it cannot be seen to taper, without the glass.

(688) The square can be filed up, when worn, in different ways If you have a lathe with split chucks, or with a Beach chuck, and an index wheel on the large end of the band pulley, you can fasten the arbor in the chuck, and use the index to hold the square truly in the four positions. A rest and guide for the file can be fitted in the tail stock, or in the rest holder, and many lathes are furnished with such attachments by the makers. Instead of filing the square, it would not be difficult to fit up a cutter and grinder, to be mounted on the slide rest, and arranged to feed up along the square, from the tip to the shoulder, adjusting it by the cross slide to take off any desired amount of the metal. When one side had been properly cut, it could be fed directly backward, the spindle and arbor turned, and the cutter fed slowly forward again, when it would cut this side of the square like the former one, and so with the others.

(689) If the workman has no such lathe, a handy tool for squaring arbors, and similar work; is shown in Fig. 41. It consists of a long frame, with a block *a*, by whieh it is screwed in the bench vise, and arranged to take in the pin vise *d*, or any similar tool for holding the barrel arbor. The arbor square rests in a notch in the filing block *f*, at one end of the frame. The other has a set screw *g*, with a check nut, for holding the end of the vise *d*, in the same manner as the ordinary screw head tools. That end of the vise carries a circular plate *c*, divided off, and narrow notches cut in its edge at these divisions. A thin steel slip *b* fits nicely in these notches. The pin vise must of course hold the arbor straight, or in a true central line. If it does not, make a tool that will, and line the jaws with iron bushes, to avoid marring the arbor, and yet be hard enough to keep their shape. The plate *c* may be rigidly fitted on a special vise for this tool, or arranged to slip on the ordinary pin vise when needed and fasten with a set screw.

Fig. 41.



(690) The slot *i* in the filing block *f* is wide enough to admit any arbor or other piece to be squared. A fine-threaded screw, with milled head *e*, reaches vertically up into the slot and forms its working bottom, supporting the arbor square, and is turned up to expose as much of the square as is to be filed off. Several hardened screws are let into the block *f* to protect its face from the action of the file, and cause it to cut the square perfectly flat and without taper, and also at a right angle with the length of the screw *e*, whose end should be flat and square across, else it would not raise the square uniformly in different positions. This screw should be large enough to not only fill the width of the slot, but also set a little into the back wall, as shown in the small cut, so that it would be near enough to the edge of the slot to support the shortest and smallest squares. This cut into the back wall should not reach up to the face of the block, but leave the corner of the wall full and straight at the top. Some would have the front half of the block jointed, and screw back like a vise to hold any size of square tightly, but that is not essential, as it will do as well to keep the square pressed against the back wall with the thumb while filing. A guard hook can be screwed on the back of the block, to prevent the file acting too far up on the square.

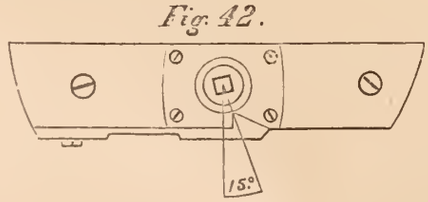
(691) To use the tool, the square is placed in the slot, the screw *e* turned up or down till the file just touches the square. Then turn the milled head to expose the proper thickness to be filed off, noting the number of turns given, (by a mark on the head,) which we will suppose is two. After filing this side down, we lift the vise out, put the next notch of the disc on the slip *b*, and file the second side of the square. On changing to the third side, we must turn the screw up two turns more, to make up for the amount filed off the first side, now resting upon it, which will bring the third and fourth sides to the same height as the other two. In this way you will file it square, flat, straight, and equal, without any trouble. You can also file two flat sides parallel with each other and with the central line of the piece. Or, by dividing off the plate *c* properly, you can file it with three, four, five, six, eight, or ten equal sides, easily and truly. Fig. 41 shows the notches, each marked with the number of sides it is designed for. The filing block *f*, can be made to turn on a pivot, and so file to a point or give any desired taper to the flats,—the tool being fastened to the bench vise so as to still admit of holding the file horizontally. By removing the plate, and rolling the pin vise as in the screw head tool, it would file to a true and central point. Many other changes could be made, but as they are foreign to the present subject they are omitted. The portion of the frame at the left of the block

a does not need to be very heavy, as the only strain is on the filing block *f*. A similar tool could be rigged up with the steel verge lathe, by fitting suitable centers, etc., to it, but the vise *d* would have to be quite short, and would not operate as well as the one described,

(692) The ratchet wheel of a solid ratchet arbor should be held by its cover snugly but not tightly, *i. e.*, it should turn smoothly and easily, but have no rock or loose play at all. If it does, it should be tightened. Put the cover or bar in the lathe, or, in some cases on a loose arbor, and turn off the under side around the edges or ends,—leaving the part which bears on the rachet untouched. This, when screwed in place, will project down into the sink lower than before, and hold the wheel. On the other hand, if the ratchet is too tight, the central part of the cover can be turned off a little, leaving the edges or ends intact; or, when the metal is quite thick, the sink can be turned out a little deeper. In some cases, the metal bottom of the sink can be driven up, to hold the ratchet up more tightly against the cover or bar, if that is of steel and not easily turned or filed. In all cases both the upper and under surfaces of the ratchet should be smooth and free from bruises, burs, etc.; and, on the solid ratchet arbor, both surfaces should be polished, even to the points of the teeth, else they will wear and cut either the sink or the cover, and soon become loose and let the barrel or main wheel tip out of horizontal. In good work, however, it is usual to turn the teeth of the ratchet slightly thinner than the body of the wheel, just enough to make the teeth clear a plane surface which rests on the body. This is done on both surfaces, but no further in than the bottoms of the teeth.

(693) The depth of the ratchet wheel sink should be such as will let the upper surface of the wheel come just level with the surface of the bridge. The cover, being level underneath, will then hold the ratchet properly when screwed down. The size of the sink should be only slightly larger than that of the wheel. The screws that hold the cover should all of them hold well, or be replaced. If the cover is countersunk to take in the heads of its screws, they should be nicely fitted in, as they were designed to be,—not some of them level and others sticking up, some large and some small, as we often find them. Color the heads, if necessary, and take off the projecting points level with the under surface of the bridge while the barrel is off the arbor; or, if a plain arbor, while the arbor is out of the bridge. The teeth of the rachet wheel should all be sound and sharp, and free from thick dirt or other substances, so that the click can go to the bottom of every tooth. If the teeth are bruised up, on a solid ratchet arbor, they should be filed up clean and sharp, being careful to keep their faces in a radial line from the center of the wheel. If undercut, the teeth will be weakened; if the faces are inclined in the opposite direction, ever so little, the click will slip off. In filing up the backs of the teeth, do most of the cutting at the bottom, sparing the points as much as possible, so that the size of the wheel will be but slightly diminished when the spaces between the teeth have been cut deeply enough. Of course both backs and fronts should be filed truly vertical, or parallel with the center line of the arbor. If you have a cutting engine, the wheel could be more easily and accurately re-cut with that.

Fig. 42.



(694) The point of the click should take into the wheel, not at its top or highest point, but about 12° to 15° from that, on the locking side of the wheel, as shown in Fig. 42, where one line runs from the center of the wheel to its highest point, at a right angle to the line of the click; the other shows the distance from the former line that the point of the click should engage with the wheel, and the proper inclination for the locking face of the click. As the locking faces of the teeth are in radial lines, this form causes the locking faces of the click and the teeth to coincide. Evidently, if the click engages with the wheel further to the right, its locking face must be more inclined or undercut, or the teeth will slip off; if further to the left, it should be less inclined, or all the pressure will come on the extreme point of the click, which will be very thin if the back or lifting face has been filed away to allow it to enter the teeth well. If it has not, but the click is of the same shape as shown, and engages with the wheel further to the left, then it will scarcely reach into the teeth below their points. Wherever it engages, its locking face should be in a radial line from the centre of the wheel, and the distance stated from the top of the wheel will be found the best,—more is unnecessary, and the wheel "gigs back" too much in winding; less is unsafe, as will be seen if the locking face is formed in the left-hand line, when the slightest fault of either tooth or click would cause slipping off.

(695) The back or lifting face of the click should be formed to correspond with the space between the teeth. If the point of the click is more obtuse or blunt than this space, it cannot go to the bottom of the teeth; if more acute and sharp, the point will be thinenr and weaker, and the teeth will wear off the point faster, owing to the lifting face being more inclined and therefore more hard to lift. If the faces are adapted to each other as stated, we obtain the greatest strength of the parts, with the best action, and the least wear. The workman should therefore take pains to have his clicks (whether loose or otherwise,) well fitted to the wheels. The edge of the bridge and ratchet cover should be filed out to admit the click as represented in the cut, viz :—at the left of the click point, the side of the notch should be straight, or from the point of the click to the edge of the bridge should be parallel with the left-hand radial line, as drawn. This is a good working form for the notch, and looks better than the frequent abortive attempts to fit the click on that side. There is no objection to the side of the notch being parallel with the locking side of the click, if they are far enough apart to allow the click to be lifted entirely out of the wheel without touching in the notch. The right side of the notch should fit nicely upon the back or lifting face of the click, while that rests properly in the wheel. This gives the point of the click a good support against the pressure of the tooth, renders it less liable to break off, and obviates any tendency to bend the spring part of the click and slip off, besides relieving the spring and screw from any undue strain, which, in the absence of such support, would come entirely on the screw and steady pin, or, if there was no steady pin, upon the screw above.

(696) Both faces of the click should be vertical, so that there will be a straight pull, with no tendency to push the click up or down, and slip off over or under it. The upper and under surfaces of the click should be just level with the corresponding surfaces of the bridge, except the spring part, which may reach below the bridge, i it is at a safe distance above the barrel. If liable to rub, it should be filed away enough to clear. Also see that the bottom of the click foot, where it rests on the plate, is level with the sole of the main wheel bridge. If it sticks below it, at either side of the click screw it will cause the point of the click to work up, or down, according to which side sticks out. See that the side of the click foot cannot touch the main wheel teeth, nor the click point rub the top of the barrel, that the click screw holds well, and that it is screwed firmly down.

(697) In examining, see that the shape of the click is as before directed, that the point is sharp and perfect, smooth, if not polished, and that it can and does reach to the very bottom of every tooth on the wheel, freely and without pressure upon it. If the point is worn or cut, a new click should generally be fitted. But if only very slightly injured, file out the wear or cut, keeping the shape as already described, then file back the edge of the bridge (and ratchet cover) to let the lick reach the wheel. Do not file the supporting wall of the notch, (696), unless considerable change is made, but draw the click to the left by bending the steady pen, (628), and filing out the screw

hole to permit of that movement. This method will preserve the proper shapes and actions of the parts as far as possible ; but if the point was much worn the only way to do a good job is to fit in a new click, and it will be about as easy as to make the necessary alterations of the old one and fit everything to its new shape,—which after al will not be fully satisfactory. If a spring click works under the ratchet cover, see that it does not rub hard on it. If it does, free it or file the edge of the cover back even with that of the bridge. If the click rubs up under the ratchet bar, file the under side of its arm to free the click. If the click bears too hard on the wheel, its strength is diminished by filing the spring par tthinner, not narrower, being careful not to leave sharp square corners at the ends, but round shoulders. The point of the click must always be hard. If not, it should be taken of and hardened, then tempered—the spring to a blue, the point to yellow.

(698) *Loose click.*—In the case of a loose click, pivoted and fastened at the right of the rachet, instead of at the left, as shown in Fig. 41, the faces of its point should be of the same form and act on the wheel at the same place as shown in the cut for the spring click. It should work freely but not loosely on the shoulder or pivot of its enter, its upper surface just level with the upper surface of the bridge and shoulder, and its screw should set down closely on the shoulder and reach out well over the click ring, holding it so that the point cannot tip up or down, yet not tight. If the click plays under the ratchet cover or strap, it must be free between that and its seat, but not loose. Try its freedom of motion without the spring, and see that the point can reach the bottom of the teeth freely, with the slightest pressure.

(699) Above all, the click screw must hold well, and be proof against being worked up and loosened by the action of the click. When this occurs, either the screw head does not come down solidly against the top of the shoulder, or, if it does, the click ring is too thick and binds under the screw head, and the friction works the head up by the motion of the click. The remedy is to thin the ring on its under surface, so that the head can be screwed down fast against the shoulder and still leave the ring free. If the screw does not hold, never try to tighten it by closing the hole in the shoulder, as you will generally fail, and will besides be almost certain to spread and enlarge the shoulder, so that it will bind in the click ring, and also to shorten it so much that, if the screw head is brought down against the shoulder, it will bind on the top of the click ring. Flatting the threads of the screw is about as bad, as it will probably break off in the hole, if you screw it down tight. When screws are so cheap, there is no excuse for any such botching.

(700) If the point of the click is broken off, worn or cut, a new click should be fitted, as a satisfactory job can seldom be made by altering the old one over. Clicks are cheap, and out of a good stock a new one can generally be found which will be very nearly correct. But if it has to be altered much, do not try to work it while hard, but soften it at once, shape it up properly, smooth it off, harden, draw to a dark blue with a yellow point, then polish the surface nicely and you have a good job, done in about the same time, or less, than you would spend in fooling over the old one, and altering the bridge, spring, etc., to suit it. No one but a botch will ever file away the bridge under the click, yet we often find them filed off almost to the shoulder, leaving no support for the click except the screw head bearing on top of the ring. To save the trouble of filing the extra thickness of the point to proper dimensions, the seat of the click was taken off, to get it out of the way of the click point. When this is removed, it is difficult to replace it so as to afford a good support for holding the click up to its place. Of course, the gilt upper surface of the bridge must not be marred, but the underside chamfered off and a piece dovetailed in or spliced on, and soft soldered. The face or surface, on which the click is to lie, must be shaped and finished properly before the piece is soldered on. Then clean off, level and smooth up all the surfaces nicely.

(701) *Click Spring.*—The fitting of this should require no special directions after what has been said, except as to its action on the click. The end of the spring should press on the click half or two-thirds its length from its point to its horn. This can be brought about by slightly curving the end of the spring at the proper place. If it bears on the click at its point, it gives too much pressure, the only effect of which is to make the click and the ratchet teeth wear and cut each other faster. But, of course, if the spring is very weak, or bears on the click too near its ring, more pressure can be given by causing it to bear nearer to the point. If the spring is too long, its end may press against the curve at the foot of the horn, when the the tendency will be to push the horn back and keep the click from going entirely down to its place. If so, break off the end of the spring, or curve it outwards, out of contact with the click. When the spring is screwed in place, try the click to see if its point is held down to the bottom of the teeth, or if it has a little play between the wheel and the spring. This may be caused by the spring resting against the edge of the bridge, which projects out beyond the click when in the wheel, and keeps the spring from contact with it in that position. In this case, file away the edge of the bridge till the spring holds the click up to its work,—always provided that the click itself is of proper shape and thickness. If not, that should be replaced.

(702) *Slit Click, etc.*—In the slit click, the end of the slot takes the place of the locking face of the ordinary clicks, and its shape and position should be as already directed for them. The workman will save himself a good deal of time and trouble by purchasing a good assortment of these clicks, with slots of different widths and lengths, as they are troublesome things to alter. But if any considerable alteration of the slot, etc., is required, soften it at once, and so save your patience and files. Then harden and temper as already stated. Circular clicks, and those of all other shapes, should have the same form of point, *i. e.*, the locking face in radial line from the center of the rachet. It has seemed necessary to be full and explicit on the winding works, as the constant trouble arising from them show either great ignorance or carelessness on the part of the repairers, for which there is no excuse, as it is very simple to understand how they should be, and very easy to make them so. All these parts are best tested and corrected with the barrel removed from the arbor, which latter is tried along with the bridge, click, etc.

(703) *Arbor Bearings.*—The solid ratchet arbor has but one bearing : that in the main wheel bridge. The plain arbor also has a bearing for its lower end, in the barrel cross bar. Owing to the great pressure, these bearings wear fast unless the arbor is well polished, free from rust, etc. If the hole in the bridge is worn, it is generally in the direction from the center pinion, and makes the depthing more shallow. Examine, and, if so, close the hole from the outside towards the center pinion. The depthing of the main wheel in the center pinion can be changed in like manner, by opening the arbor hole towards the pinion and closing up behind, (670). In closing up the hole, attention should be paid to moving the whole side up, and not merely the metal at the ends of the holes, (678). If badly worn, or if it is desired to have the metal thicker, ream out the hole, (679), fit a hard brass wire from the under side, with the end just level with the inside or bottom of the ratchet wheel sink, then head it down inside, and also soft solder it if thought necessary,—being sure to clean off all traces of the soldering fluid.

(704) The place for the hole can easily be marked by centering from the circumference of the ratchet sink with a pair of fine dividers. But it is better, and more certain to be correct, to mark it with the depthing tool. Mount the center pinion and the main wheel in the tool, adjust it to give a correct depthing, screw both the center and main wheel bridges in their places on the plate, without the wheels, adjust the projection of the depthing tool arbor so that, when one point is in the center pinion hole and the other rests on the bush just inserted, the two arbors will be vertical to the plate, when a curve should be marked across the bush by the arbor point resting on it. This gives the proper distance from the center pinion hole for a correct depthing. The place for drilling can be marked on this curve midway between the sides of the ratchet sink, unless that has been cut out of shape. If so, screw on the ratchet bar or cover, and mark the center of the hole through that upon the curve. The hole can either be drilled by hand at the intersection of this mark and the

curve, or made with a cutter in the lathe. In the latter case, the inside of the rachet sink can also be turned out or trued, if desired. The upper shoulder of the arbor should project out or stand below the under surface of the main wheel bridge according to the room to spare, but always far enough to keep the main wheel or top of barrel clear of the bridge.

(705) If the bush in the lower or barrel cross bar is worn, a plug can be fitted as before described, and centered from the hole in the bridge above, which will make the arbor truly upright. This can be done by fastening in the lathe the plate, with the bridge screwed in position, centering it by the hole in the bridge, and making the hole in the bar with the cutter. If the workman has no suitable lathe, he can fasten the plate in the old fashioned upright drilling tool, centering it by the bridge hole as before, then remove the bridge and bring the point of the arbor down upon the plug in the cross bar, when the mark thus made will be in the same vertical line with the center of the bridge hole. The same thing can be done with the upright-holder, (55), the angle-meter, (438), and some of the staking tools in the market. When the old hole is yet in tolerable condition, its position can be marked by scratching two crossed lines on the bar, each line passing through the center of the hole. After the plug is fastened in, the straight edge can be laid along the bar and these broken lines continued across the plug, and their crossing will of course show where the center of the old hole was. But it will be about as easy to upright from the bridge hole as before described, and then it is certain to be correct.

Soldering.

TO do a good job of hard soldering is quite an achievement, as its practice involves a great many considerations of chemistry as well as physics. There is no secret in the art, and yet the quality of the majority of the work done in the ordinary stores is so badly executed that it would seem that the art of soldering was unknown. We will leave it to any good workman to say what proportion of the repairs made is either workmanlike, or even tolerably well done. A professional jewelry manufacturer cannot be excused for such slovenly work, the more especially when we take in the fact that in a great many cases the repairs to jewelry are positive barriers to any subsequent operations. No doubt this evil has arisen as much from the nature of the jewely as from ignorance. Let a fine brooch be repaired, it will, in the majority of cases be found that the repairer has soldered the joint or catch, as the case may be, with soft solder. Should he have heated it too much it will be found very difficult at any other time for even a skillful workman to repair, except in the same manner. In all jewelry that is made with soft solder no other resource is left the workman than to use the same ; but in all goods that are originally hard-soldered no excuse can be made for the use of any lead or tin solder. Perhaps there may be a color to the article, which the heat may spoil ; if the repairer has no means of restoring that color he will be compelled to use the material that fuses at the lowest degree of temperature. This case is a very common one, and is indicative of the slight knowledge the workman possesses. We will state here that these remarks are not intended to apply to those whose trade is jewelry ; they are informed on the subject well enough to choose the proper mode of repairing. The general watch repairer is very often called upon to do this kind of work ; the repairing of jewelry being a very important and lucrative branch of his business. He should then be prepared to execute all jobs so well that the repairs may not be apparent. If he spoils the color of the work he should have the means of restoring it ; his solder should be adapted to every class of work, and his polishing apparatus sufficiently extensive to enable him to make the piece look like new work—as well indeed as it did when it came first out of the factory.

The prices ordinarily paid for jewelry work are too small, or rather is but one price for all classes of work, and the cheapest method is adopted, and this fact accounts in many cases for the bad work. This, however should not deter the repairer from making a discrimination in his prices and doing the work accordingly.

For the ordinary run of hard-solder work, silver solder, or two carat gold will be all that is needed. The choice of either will be determined by the color or quality of the goods. There are many receipts given for the composition of these solders, but it requires some knowledge of melting alloys, that are to be of a given composition. The workman may, however, make his silver solder with the blow-pipe, on a piece of coal by alloying, say a dwt. of silver (coin is about right), with about 6 grains of brass. This brass should be common pins, as they have a slight trace of tin added when they are colored, and after the two metals are in a state of fusion a small quantity of tin may be added. When hammered or rolled out, and the surface scraped clean, this compositiou will be found to melt at a low heat, and run, or flow, very readily. We have not been particular as to the proportions, as it will be easy enough for the workman to vary them to the required degree of fusibility. The tin is a very important ingredient, as it renders the solder more likely to flow freely. The use of this solder is attended with but very little risk if the workman has the joints well cleaned and amply protected by McLane's anti-oxidizer. It often happens that what are called red gold rings are broken and brought in for repair. They are fusible at so low a degree that they will fuse before the silver solder ; still they may be repaired with it in the following manner : Having filed the ends of the fracture true with each other, the ring is closed so as to make a close joint, a piece of the solder, very thin, is cut about the size of the section of the ends, and the joint is now forced open and the piece of solder is placed in the opening ; the surfaces having been well covered with borax, the ring is submitted to the heat of a blow-pipe applied with caution—the object being not to fuse the solder—until the operator finds that the solder begins to glisten on the surface, the ring being hardly red hot ; it will now be found that a perfect joint has been made without having melted the solder. This is called sweating, and may be followed in all cases where there is reason to doubt the fusing point of the work. The gold solder is used on a much higher class of goods than the silver. Some articles of jewelry are filled with this two carat solder, the outside being a very thin shell of sixteen carat gold. In repairing these articles it is generally best to use the silver solder, though in the case of a ring the ends of tha fracture may be prepared as stated in the other case. The lining, however, must be bound with wire to prevent separation. The ring is then heated just enough to melt the contained solder at the extreme ends, being withdrawn the instant the sweating has been discerned. This makes a very neat job, and requires no filing to get rid of the surplus of the solder. There is little to be said as to soft solder except that there are some goods put together with a metal that melts a little above the boiling point of water ; any of the ordinary soft solders would be inapplicable in such work. The workman may, however, make a solder by melting two parts of lead with two of bismuth, and one part tin ; this alloy melts at a temperature of 236° A., and may be used with perfect safety on any filled work ; but it does not make a very sound joint ; it is used with the ordinary soldering fluid.

It may be of some profit to many to know how to solder rings with settings that may be damaged by the heat. Pearls, enamel, torquoise, and opals are liable to injury, and the taking them out and resetting would involve some time and labor. The work can be done with safety if the workman will bury the part to be protected in a piece of raw potato, placing inside the ring a small piece of charcoal. The soldering may now be done by fusion or sweating, as the circumstances may dictate.

WE learn from the Paris papers that in addition to the grand diploma of honor, Switzerland has been awarded eight gold medals, twenty-five silver medals, thirty bronze medals and twenty-five honorable mentions in the department of Horological Industries. Among those we noticed an award of a gold medal to Mons. E. Francellon, the manufacturer of the Longines watch. This is the highest official recognition of any low priced Swiss watch and must be very gratifying to the recipient. Mr. J. EUGENE ROBERT, of 30 Maiden Lane, is the agent in this country for the watch.

Precious Stones and Gems.

BY EDWIN W. STREETER.

THE term "Corundum" is used to denote the class of aluminous stones generally; or secondly, to particularize a species or subdivision of that class. It includes in the general term sapphires, rubies, emery, corundum (proper), and other species or varieties.

The primitive forms of the crystals is a six-sided prism, but a common form is the dodecahedron, with faces formed after the figure of isosceles triangles. The crystals are very rough, and often deformed. Twins with rhombic faces are not infrequently met with.

Besides the crystalline form, corundum appears in compact masses, and in aggregate of grains varying in their size.

Cleavage, more or less perfect. Fracture, conchoidal and uneven. Structure, brittle. Hardness, 9. It is scratched by the diamond, but by no other mineral. All imperfect sorts are broken up into polishing material for other stones.

The blue saphire is of equal hardness with the ruby, and both exceed in hardness emery or corundum (proper). Its specific gravity is about 4.

For rubies and sapphires - - -	4·6 to 4·8
" corundum - - - - -	3·6 to 4·9
" emery - - - - - -	3·7 to 4·3

Corundum is sometimes colorless, and then it is very brilliant. As a general rule, however, it is colored blue: (sapphire), red (ruby), or else grey, yellow, brown, or green. The streak is white. Its lustre is vitreous, sometimes pearly on the basal planes, occasionally exhibiting a bright opalescent star of six rays in the direction of the axis. The corundum is transparent. Its refractive index is 1·77, and therefore higher than that of glass, which is 1·5. By friction electricity is developed in it, and polished specimens the electrical condition remains for a considerable time.

The characteristic constituent of corundum is alumina, ($Al^2 O^3$), with a slight admixture of oxide of iron, chromic acid, or some other pigment. Acids have no effect upon it. It fuses not without difficulty with borax, if in fine powder. Alkalies have no effect upon it.

Corundum is found (1) associated with sand or detritus with other precious stones. (2) in crystalline rocks, such as granite, mica slate, granular limestone or dolomite. (3) In the beds of rivers, either in modified hexagonal prisms, or in masses accompanied by grains of magnetic-iron-ore.

The prominent forms of crystallization are the six-sided prism and the hexagonal pyramid. The predominant colors are blue and red.

Azure blue, indigo, duck's-neck color, violet-blue, poppy-red, cochineal, carmine, rose-red to rose-white, milk-white, yellow-white, French-white, lemon-color and green. As a rule the colors are pure and high. Sometimes a crystal is found exhibiting a variety of colors. The asteria or star sapphire shows, under the microscope, thread-like shafts directed towards the faces of the six-sided prisms, said to be spaces left at the moment of crystallization, and it is the reflection of the light from these which give to the stone its star-like brilliancy.

The blue variety is called sapphire in its limited sense.

The red variety is the ruby.

Other varieties deserve notice, such as spinel, garnet, zircon, etc.

The finest rubies and sapphires are found in largest quantities in Burmah, at Mo-gast and Kiat-pyan, five days' journey from Ava.

The small sapphires of Ceylon are well nigh all of a rose-red. They can be obtained easily from old collections, as they were formerly used officially. They are so clearly crystallized that they are easily distinguished from spinel, which often accompanies them. Those found in Ceylon, Siam, and other Eastern countries, are remarkable for their colors. They are found like rolled pebbles in channels of rivers, and the colors run through green, red, yellow, and black. Bertolacci affirms that "the brilliancy and beauty of those in Pegu far exceed those found in Ceylon."

At the foot of the Capelan Mountain, near Sirian, a city of Pegu, and in the vicinity of Candy, corundum is also found in the detritus of granite, magnetic-iron, zircon, etc., all having been probably washed down from the granite mountains.

In Ceylon the sapphire is common, the ruby very rare; but the converse in the case in Pegu.

There are famous mines of rubies at Badakshan in Usbekistan, a part of Tartary. The mines were known to the Emperors of Delhi. They are on the slopes of the Oxus, near Shunan. There is a belief among the natives that two large rubies always lie together: thus it is that the fortunate finder of the one hides it until he has found the twin like it; failing this, they will often break a large one in two. There is a belief also that the ruby is the product of the transformation of limestone, and that it is found in the form of pebbles. Near to the ruby mines a great quantity of blue felspar is obtained.

It is affirmed that in North America, the sapphire is found of a beautiful blue, with hornblende, mica, felspar, tourmaline, ironstone, talc and calc-spar, and also well-formed six-sided prisms or rhombohedria of good size.

Granulated limestone, accompanied by spinel and rutile, with pale-blue crystals and kyanite, are found in Connecticut and Pennsylvania, with a greyish corundum in fine crystals; also in Chester county, crystals are found with tourmaline. In Margarite and Albiee some of the masses are said to weigh 4,000 pounds. A boulder of massive corundum affording broad cleavage surface was found in North Carolina.

A fine red sapphire, in company with the diamond, is said to have been found in South America.

At Ballarat, in Victoria, the blue and white sapphires are found with some specimens highly crystalized, and exhibiting beautiful dichroism; and it is affirmed that in the hanging-rock caves, by the Pearl river, in New South Wales, blue and white striped six-sided prisms of beautiful rubies and sapphires are found.

In Bohemia, from the Iser Mountains, small rounded crystals of sapphire have been found, mostly in the quartz sand and detritus of granite. The land about the Iser table-land is in part marshy, and in part covered with forests. The little Iser rushes through, its rapid current carrying the detritus in which the minerals in small quantities and size are found. But the sapphires found in the Giant Mountains often exceed in beauty and color those of Ceylon. The beds of the Iser—bed and meadow—appear to have been much, although irregularly, worked.

Small crystals are found in Saxon Switzerland, in alluvial soil, and are said to occur at St. Gothard, of a red or blue tinge, in dolomite.

The mineral generally termed corundum, is found in crystals with rough planes as a rule, and in individualized masses of particular cleavage. The rhombohedral form occurs as in the former varieties, but here only in combinations. The fracture is uneven. The colors, generally dull, are of greenish-grey, greenish-white, asparagus tint, oil, pearl grey, flesh or rose red, sometimes of a chestnut brown. It has only an inferior degree of transparency. The last named variety comes from China, and because a peculiar bluish light occasionally plays upon it, Werner called it "Diamond Spar." It is said that some crystals found near St. Gothard, exhibit two colors, and that some of these are in dolomite, but more commonly they are found in mass. Some in Styria have grown in with the granite, and so firmly that it is difficult, if not impossible, to remove them without damage. The crystals may be from the size of a pea, to that of a hazel nut, of a greenish-blue or duck's-neck violet. Some pieces display several colors. In Bohemia they are found imbedded in pebbly masses of hercinite. In Rhodes, Sweden, and the Urals, they may also be found with tourmaline in schist, with platinum and magnetic iron ore. In Ceylon, China, and India, they are found in beautiful green crystals, possessing characteristic stripes, with black hornblende.

It is round in small, compact, and fine-grained conglomerate varieties, in color varying from bluish-green to indigo blue, generally deriving its impurity from magnetic iron ore. For ages past emery has served as material for polishing other minerals. The Jews called

it *shameer*. "The sin of Judah is written with a pen of iron and with the point of a *diamond*."

Emery is also found in large boulders in Naxos, which has long been famous for this stone. This island has, running through it from north to south, a chain of mountains, partly formed of granite. In the granite is granulated lime with deep fissures, enclosing emery with layers of mica. Of late years, the quantity annually produced on this island for the government, has been 50,000 centners. The emery which is sought for technical purposes is a mixture of greenish-white corundum and magnetic iron stone. Sometimes indeed, though rarely, in the middle of a mass of emery, a regular prism of dark blue corundum is found. The best place for finding emery in the island of Naxos, is Bothri. Its usual color is ashy-grey, which at times gets a reddish-brown tinge from the oxide of iron. Emery acts powerfully upon the magnet. Of late years we have obtained an important quantity from Asia Minor (twelve miles east of Ephesus), but it is not so good in quality as that obtained from the island of Naxos. For its discovery here, as well as in Kula, Adula, and Manser, this last being twenty-four miles north of Smyrna, we are indebted to Dr. Lawrence Smith. According to Dr. Smith, emery is a combination of corundum, magnetic iron oxide, and iron-mica. This last can be clearly seen by means of a microscope.

The Oriental ruby is a corundum, and is sometimes found loose in sand or debris in company with other precious stones, but more often it is found embedded in granite, basalt, gneiss, talc, syenite, and hornblende. It consists of alumina with a little coloring matter. The specific gravity of the oriental ruby is 4·6 to 4·8, and its hardness 9. It will cut sapphire, emerald, topaz, rock crystal, and all other stones, save the diamond. It possesses double refraction, though in a small degree, and the electric condition obtained by friction remains for hours. Its color is carmine, cochineal, or pigeon-blood, and rose-red, often with a play of violet. It is frequently asserted that the white spots often detected on the rough stone, may be removed by careful appliance of heat; but this is not true, and it is certainly a dangerous experiment, for if heat be recklessly applied, it will split the stone into pieces. Kluge says "that before the blow-pipe it shows a remarkable change of colors, which is the more striking in the small pieces. If small crystals are made red hot and allowed to cool, they become colorless, then after a time green, and lastly they regain their beautiful red color." I cannot vouch for this from my own experience, but if true, this experiment would be most valuable, as the means of ascertaining the genuineness of the oriental ruby; crystals of red spinel never become green in the process of heating and cooling.

The so-called Brazilian ruby is a pink topaz, and differs entirely in its characters from rubies. Its specific gravity is 3·4 to 3·6. Hardness 8. It cuts rock crystal, but less easily than the others; possesses double refraction, and retains electricity for twenty-four hours. Broken pieces when heated show a phosphorescent blue light. The original color of most of these rubies is yellow, and it is by means of heat they receive the beautiful bright red or dark cochineal; they are found mostly in the debris of mica-schist, in brown iron-stone, or in quartz veins.

There are some very famous and remarkable rubies on record For example, there was an oriental ruby of the size of a pigeon's egg in the crown of the Empress Catharine of Russia, which is said to have been presented to her by Gustavus III. of Sweden, when on a visit to St. Petersburg, 1777. One in Paris, seen by Faretiere, weighed 406½ carats, and Chardin speaks with admiration of a ruby cut "*en cabochon*," of great beauty, and of the size and form of half an egg, having the name of "*Thelk Lephy*" engraved on the point.

There are two very large rubies in the possession of the King of Awakan, in India.

The King of Ada has a perfect ruby of the size of a small hen's egg, which he wears as an ear-drop.

The slippers of Chinese and Indian women are ornamented with rubies cut *en cabochon*, that is, with convex, non-faceted tops; vases, armour, scabbards and harness, are also graced by the same stone in India and China. These stones, however, are of little value. Bags of them are, indeed, laid beneath the foundations of buildings, the idea prevailing that good fortune was thus secured to the structure.

It is reported that the King of Burmah has a ruby of the size of a pigeon's egg and of extraordinary quality, but no European has seen it.

The two most important rubies ever known in Europe, were brought into England during the year 1875. One was a dark-colored stone, cushion-shape, weighing 37 carats, the other a blunt, drop-shape, of $47\frac{1}{16}$ carats.

It was deemed advisable to have these stones recut; and the work was entrusted to Mr. James N. Foster, of London, who re-cut the stone of 37 carats to $32\frac{5}{16}$, and the one of 47 carats to $39\frac{9}{16}$. They were much improved by the re-cutting, and competent judges pronounced them the finest stones of their size yet seen, their color being truly magnificent. I have reason to believe that the smaller stone of the two was sold abroad for over £10,000; the larger one likewise found a purchaser on the continent. The fact of two such fine gems appearing contemporaneously is unparalleled in the history of precious stones in Europe. It is questionable, however, if the London market would ever have seen these truly royal gems, but for the poverty of the Burmese government, which is said to have been the cause of their disposal. In Burmah, the sale of these two rubies caused intense excitement: a military guard being considered necessary to escort the persons conveying the package to the vessel. No regalia in Europe contains two such fine and important rubies.

The most beautiful rubies come from the kingdom of Burmah, about five days' journey east-south-east of Ava. The inhabitants believe that they ripen in the earth; that they are at first colorless and crude, and gradually as they ripen become yellow, green, blue, and last of all, *red*, this being considered the highest point of beauty and ripeness. There is a law in force in Burmah, which deprives the market of the most beautiful rubies. Whoever finds a ruby of a certain weight (100 ticals), is bound, under pain of losing his life, to deliver it up to the financial department of the government. In order to avoid this loss of life and property the finder breaks it up into small pieces, thereby causing infinitely greater loss to the government than he gains. Surely this is a traveler's tale. It was thought that when Pegu, the "Fatherland of Rubies," was annexed to England in 1852, Europe would be the richer in these beautiful stones, but it has not proved so. It appears that certain dangers exist, or are said to exist, in the lands where rubies are found, such as wild beasts and reptiles. It is possible that these may be exaggerated by the ruby merchants in order to hinder competition. The King of Burmah is known to be excessively fond of these stones. He jealously prohibits the export of them, so that, save through the agency of private individuals or by stealth, scarcely any rubies pass out of his country.

Very beautiful rubies have been found in a part of Tartary called Badakshan for many years. They are found also on the slopes of the Oxus, near to Shushan and Charan. The inhabitants believe that rubies always occur in "pairs." When one of the seekers has fortunately discovered one, he will frequently hide it till its mate is found.

The oriental ruby is indisputably one of the most valuable of precious stones. Theophrastus speaks of it as incombustible, and as having the appearance of a burning coal when held up to the sun. He is said to have given forty gold pieces for a very small one. The price paid for this stone by the ancients was very high. According to Benvenuto Cellini, in his time a perfect ruby of a carat weight cost 800 Ecus d'Or, whilst a diamond of like weight cost only 100.

Rubies with flaws, or with specks of a milky appearance on the table or beneath it, and rubies of too deep or too light a color, are now much depreciated in value. In former years, when the inferior stones could be sold in the foreign markets, they were worth at least fifty per cent. more than they are at the present time.

There are, it is true, many large rubies to be met with in the market, and this statement may seem to contradict the above assertion, but these are by no means of the same value as the Burmese rubies. They come from Siam, and have a distinctly dark brown tint, marring the true "pigeon's blood" hue. This variety does not realize above half the price obtained for rubies of the same size of the true color.

Cleaning and Repairing French Clocks.

THERE are probably no class of clocks used for the ordinary purposes of life that are capable of giving better satisfaction to the public, or less trouble to the dealer and repairer, than those known by the name of French clocks. Their comparative moderate cost, when real worth is taken into consideration, and the beautifully artistic design of the cases, has been the means of creating a demand for them in refined communities, all over the globe. Works of art in this line, which were at one time only to be found in the palaces and castles of kings and noblemen, have found their way into the dwellings of those possessed of less affluence, and in various grades of quality they are gradually being introduced into the homes of all possessed of a cultivated taste, and a moderate income.

The cleaning and management of these clocks, although simple, and requiring care and a little experience, more than any other qualification, is seldom done in a manner that gives full justice to the clock ; and it is our object, in the present paper, to impart a few hints to those who may not have had the necessary experience ; and we will begin by making a few remarks on new, or newly imported clocks.

It occasionally occurs in newly imported French clocks, that a movement has been fitted to a case that is not high enough to allow the pendulum to swing free when the clock is regulated to the proper time. Sometimes filing a little off the bevelled edge of the ball will allow the pendulum to clear the bottom of the case or stand of the clock, and allow it to be brought to time. Should any more than just a little taken off the edge of the ball be required, there is no use troubling with it further. You must either get a new movement, or alter the train, or make a new pendulum ball of a peculiar shape. The train is easiest altered by putting in a new scapewheel pinion containing one leaf less than the old one. In all large cities, where pinion wire can be had, putting in a new pinion is not much trouble to the practical workman ; but if this cannot be done, and a new movement cannot be had, a new pendulum ball of an oblong shape may be used.

After they are unpacked, whether they are apparently in good condition or not, it is always well to take the movements to pieces, and to examine every action in the clock. You may begin by taking off the hands and the dial, first trying if the hands move freely, then examine the drops of the escapement to see if they are equal, and if they are not exactly equal, they can easily be corrected by moving the front bush of the pallet arbor with the screw-driver, making a light mark across the bush with a sharp point, which will show how much the bush has been moved. The fly pitching may next be examined, and adjusted by a movable bush in the same way. The object of this bush being left movable is to admit of the depth to be set so that the fly will make the least noise possible, and also to regulate the speed of the striking train. The dial work and the repeating work may now be removed, and the *springs let down*, and the end and side shakes of the pivots in their holes carefully tried, and all the depths examined ; but as a general rule they will be found to be correct. The pivots will, in some instances, be a little rough, and it will not be much trouble for a watchmaker to smooth them a little. After examining the main-springs, and noticing that the arbors are free in the barrels, the clock may be cleaned out and put together. This will be most conveniently done by placing all the wheels first on the back plate, putting the front one on the top. Get all the long pivots into their holes first, and as soon as possible put a pin into the bottom pillars. The locking of these clocks are very simple, and all the pieces are marked that are necessary to be marked. All the workman has to do is to follow the marks and he cannot go wrong ; but should he begin to bend or twist anything, he will soon find himself in serious trouble.

There are a few items that we wish to direct special attention to. Be sure that the arbors in the barrels are oiled, and that the mainsprings are hooked before you put them in the frame, and be sure there is oil on the pivots below the winding ratchets before they are put on, and that the wheel that carries the minute hand moves round the centre pinion with the proper tension, before you put on the dial. After dial is put on, this cannot be remedied without taking it off again, and if the hands are loose, results fatal to the character of the clock are sure to follow. We can recall an instance where a customer left an order at one of the most celebrated watchmakers in the United States to have a French clock put in order. One of the workmen, who had the name of being a good watchmaker, was sent to examine the clock, and he brought it away, cleaned it, and took it home again. For months complaints came in that the clock went slow, and the man who cleaned it always went and altered the regulator, but with no good results, and the clock was a second time brought to the store. It was examined, and the small wheel on the top of the regulator was found to have been wrenched off. The regulator was a Breguet one, and when the piece that slides on the pendulum spring was raised as far as it could go, of course any farther turning of the regulator square at the point of the dial, wrenched the wheel off, as we have stated. Now the real cause of all this trouble and annoyance to every one concerned, was nothing more or less than the hands were loose in some positions in which they were set, and when the clock was in the act of discharging the striking part every half hour, the hands sometimes fell back a little, and the clock appeared to be going slow.

In regulating one of these clocks, especially if you have got a distance to do, and are not conversant with all its peculiarities, it is always safest to turn the case round, examine the regulator, and if it is a Breguet one, put a slight mark with a sharp point across the regulator, and when the regulating square is turned you will see exactly how much the regulator is altered ; because there is sometimes a want of truth in the screw that moves the sliding piece, which deceives people as to the value of the amount they may have moved the regulator. There are various kinds of regulators, but probably the Breguet one is the most common of those of modern construction. Those that have silken thread regulators should always be regulated with caution, and when small alterations have to be made, it is well to use an eye-glass and notice how much the pendulum is moved up or down. When a clock with such a regulator has to be moved or carried about, when it is out of the case, it is always safe to mark the place where the pendulum worked in the back fork when it was regulated to time ; for, should the thread be disarranged, it can be adjusted so as to bring the mark on the pendulum to its proper place, and the regulation of the clock will not be lost thereby.

On fastening one of these clocks in its case they are generally put in beat by moving the dial round a little till the beats become equal ; but it sometimes occurs that when the clock is in beat, the dial is not square in the case. When this happens, it is always best to take the clock out of the case and bend the back fork *at its neck* till you get it to move exactly as far past the centre wheel pivot on the one side as on the other, when the pallets allow the scape wheel to escape. If this is done, the dial will be square when the clock is in beat. Some French clocks have their back forks loose, or rather spring tight, on their arbors. This is sometimes done in movements that have plain as well as jeweled pallets. If the pallets are exposed in front of the dial, you can at once detect by the eye if the clock is out of beat ; but if they are inside, you cannot tell without close listening. One of the objects of the loose crutch spoken of is that the clock can be put in beat by giving it a shake ; but it is evident that if a shake puts it in beat, another shake will put it out of beat again. We have seen great annoyance arise from these loose crutches, and long journeys made to examine clocks, when nothing was the matter with more than they were out of beat, caused by the housemaids moving them in their dusting operations. The crutches ought always to be rigidly tight, except, perhaps, when the pallets are jeweled, and the clock not liable to be moved.

As to cleaning these clocks, there remains but little to say ; they seldom if ever require any repair, except perhaps the pallets get cut, but they are generally made so as to admit of the action being shift-

ed and which is easily done. Cleaning the brass, of course, is done in the usual way. Buffs should be used for the large pieces, when very dirty; but if they are only slightly tarnished, a little cyanide of potassium dissolved in alcohol will be found very suitable.

The cases require to be handled with care, and special care should always be taken to prevent finger marks. In the very highest priced clocks this precaution is perhaps not quite so necessary, because then the cases are either real bronze, or gilt and burnished; but in the cheaper qualities. and also in some expensive patterns of cases, the gilding is easily damaged. A little cyanide of potassium and ammonia, dissolved in water, will often clean and restore it, if the gilding is not rubbed. There is a preparation sold in the form of a paste that renews the lustre of black marble cases if they have become dim. If the preparation cannot be hot conveniently, a little beeswax on a piece of flannel is a good substitute.

Although we have known some instances where there was much trouble and little satisfaction in the going of newly imported French clocks, in almost every instance the trouble could be traced to the mismanagement of those persons who were intrusted to put them in order and adjust them. A little care, and the exercise of sound judgment on the part of the workman, would prevent many annoyances that sometimes happen with pendulum French clocks.

Watch and Chronometer Jeweling

THIS whole subject is well worthy an article both in a scientific and mechanical sense, whether we consider the delicacy of the operations or the intractible character of the material operated on—for there has been no improvement in the horological trade of more importance to accuracy and durability of time-keepers.

The substitution of stone for common brass or gold bearings, was prompted by the inevitable wear of the holes from frequent cleaning, and the abrasion of the pivots, produced by the accumulation of dust with viscid oil; the pivot being cut away, or the hole opened too large. So long as the verge and cylinder were the prevailing escapements, the necessity for jeweling was not so strongly felt, except in the balance holes. The introduction of the lever escapement brought with it a better watch—capable of more accurate time, but demanding an improved construction.

An Italian, in 1723, first introduced the practice of using stone for bearings. He not only conceived the idea, but was successful as an artisan in making his own jewels; ingenious and skilful as he was, however, he encountered obstacles almost insurmountable.

The art of cutting gems, it is true, was at that time well understood, but no one had attempted to drill a hole in a hard stone fine enough for a properly sized pivot. The watches of that time that were jeweled could boast of nothing more than the balance holes, and they were not pierced to let the pivot *through*.

It is a very difficult matter to polish a taper indentation in a stone, even with modern appliances, in consequence of the tendency to create a *tit* at the bottom—thus throwing the balance staff out of upright. The difficulties in the then state of knowledge retarded the general introduction of stonework for many years. The Swiss, however, seeing the advantages derived, finally struck out the various manipulation with success. Time and experience gave more skill, and at the present time it is impossible to find a Swiss watch, even of the cheapest class, that is not jeweled in at least four holes. The English trade adopted the art later; but even then it did not become general for many years. Within a generation, only fine English levers were jeweled.

The mere substitution of a harder substance was not the only improvement; other conditions necessary to accuracy were insured. The hole could be made *round*—the material of such a character that no chemical action could be effected on the oil used for lubrication, and the vertical section of the hole could be made so as to present the least amount of frictional surface, yet still giving a perfectly polished bearing, thus avoiding the cutting of the pivot.

The whole "*modus operandi*" from the stone in the rough to the last setting up is well worth the attention of the watch repairer, and certainly that of the manufacturer.

Of the materials used in the trade, the first and most important is the diamond, used only in the time-piece as an end-stone—but at the bench all-important, as a means of making the other jewels. The diamond possesses the requisite susceptibility of polish, combined with greatest hardness of any substance known; but this adamantine quality precludes its being pierced with a through hole. Considered chemically, the diamond is pure carbon—its different varieties differing only in structure—common charcoal, its lowest—plumbago, its intermediate grade. Another variety, called the "black diamond," or "diamond carbon," occurs, which is interesting as being a parallel with emery, compared with crystallic sapphire. The form of diamond most in use for mechanical manipulations, is almost always crystallized; yet it will be seen that the agglomerated form of diamond carbon plays no unimportant part in jeweling. As a jewel, no use is made of the diamond other than as end-stone. Marine chronometers, in which the balance will weigh from five to nine pennyweights, are almost invariably furnished with a diamond end-stone, set in steel. Yet, hard as the substance is, it is often that a pivot will cut an indentation in its face. The cause of this apparent anomaly is to be found in the structural character of the gem and its value. The lapidary, saving in weight as possible, does not care, in "Rose Diamonds," to pay attention to the lines of cleavage. If the face of the stone makes a slight angle with the strata of the jewel, there occur innumerable small angles of extreme thinness—the pivot, coming in contact with any of these thin portions, may fracture it, and the fragment, becoming imbedded in the tempered steel pivot, becomes a drilling tool. In our own experience we have had marine chronometers sent for repair, that have lost their rate so much as to become utterly unreliable from this cause alone—the pivot having produced an indentation of the stone, creating more friction, and thus destroying the accuracy of the instrument.

As a general rule, the rose diamonds sold for this purpose are sufficiently good for general work. In a very fine watch or chronometer the stone should be selected with reference to its polish on the face, and its parallelism in the lines of cleavage. The diamond, however, gets its great importance from being the only agent we can use in working other stones. Without it the whole art of jeweling would not be practicable. The various steps are all connected some way with diamond in its different shapes. "Bort," the technical name for another variety, is merely fragments of the stone that have been cleaved off from a gem in process of cutting, or gems that have been cut, but found too full of flaws to become of use for ornamental jewelry purposes, the cost depending on the size, varying from $5.50 to $18 per carat. This "Bort" is used as turning tools—the larger pieces being selected and "set" in a brass wire and used on the lathe, in the same manner, and with the same facility, as the common graver. For tools, even the diamond is not of equal value—a pure white and chrystalline in structure generally being too brittle (though hard) to endure the work. Among the workmen the "London smoke," a clouded, brownish stone, is most prized—it possessing the twofold qualities of toughness and hardness.

Another form of "Bort" comes in the shape of a small globule sometimes the size of a pea; it is crystallic, and when fractured generally gives very small, indeed minute pieces of a needle shape. These are carefully selected, and form the drills with which the English hole-maker perforates the jewel. These drills, when found perfect, for soundness, form, and size, are very highly prized by the workman, as the choice of another, together with the setting, will often take a vast deal of time and labor.

"Bort" is also used in the making of the laps or mills with which the jeweler reduces the stones to a condition for the lathe and subsequent processes. For this purpose such pieces as are not fit for cutting-tools, or drills, are selected. A copper disk, having been first surfaced and turned off in the lathe, is placed on a block or

small anvil ; each piece of stone is then separately placed on the copper, and driven in with a smart blow—care being taken that no place shall occur in the disk that does not present, in revolution, some cutting point. It would seem impossible to retain the diamond fragment, but it must be remembered that the copper, being a very ductile metal, receives the piece ; the first rubbing of a hard stone then burnishes the burred edges of the indentations, over every irregular face of the diamond, leaving only a cutting edge to project. The rapidity with which such a lap, well charged, will reduce the hardest stone, is somewhat marvelous. It is the first tool used in jewelling, and so important that a more detailed and explicit description of its make will be given when the process of manufacture is treated upon,

Diamond powder is equally as important as "bort," being used in nearly every stage of jewel making. The coarsest charges the "skives" or saws used for slitting up the stone. These skives are made of soft sheet-iron, and act on the same principle as the laps. The finer grades, in bulk, resemble very much ordinary slate-pencil dust ; indeed, the latter is often used as an adulteration. This powder is not uniform in fineness, and the jewel-maker is under the necessity of separating the different grades. This is effected by a simple process called "floating off," and is conducted as follows : A certain quantity of powder, say a carat, is put into a pint of pure sweet oil, contained in some such shallow vessel as a saucer. Depending on the fluidity of the oil, the mixture, after being thoroughly incorporated, is allowed to stand undisturbed for about an hour or an hour and a half. During this time, owing to their greater gravity, the largest particles are precipitated, leaving held in suspension a powder of nearly uniform fineness. The mixture is now carefully decanted into another similar vessel, leaving the coarse powder at the bottom of the first. This coarse deposit is denominated No. 1, and is used for skives, laps, and other rough purposes. The decanted mixture in the second vessel is allowed to remain quiescent for twelve hours, when the same operation is performed ; and the third vessel now contains most of the oil, together with the finest particles of powder. The precipitate from the second decantation is the ordinary opening powder ; the finest being for polishing both the holes and outside of jewels, and giving the final finish to the faces of pallets, roller pins, locking spring jewels, etc.

The good workman is careful to keep the powder in this condition as free as possible from any extraneous dust, and above all to preserve the different grades from any intermixture, as a small quantity of a coarser grade would destroy a finer one for all its purposes, and and the process of "floating off" would have to he repeated.

The most important stone in jewelling, the diamond, becomes more of an agent of the manufacture than an object.

Properly, for jewelling the ruby and sapphire are pre-eminent ; inferior only to diamond in hardness, possessing a sufficient degree of toughness, susceptible of an exqusite polish, this (for they are one and the same) stone is the favorite of the Swiss, English, and American, for all high class work—the Swiss, however, using it indiscriminately in all watches.

The ruby proper is of one color, but in its varieties of intensity may change to a very light pink. When still lighter it is ranked a sapphire, which comes in almost every possible color and shade, from ruby to a perfect transparent colorless crystal. This stone differs in degrees of hardness and capacity of working—the hardest being a greenish yellow, in the shape of pebbles, difficult to work, but forming the strongest and most perfect jewel known.

It must be remembered that this description gives the value of the ruby and sapphire as a material for jeweling only. For ornamental jewelry, the value depending on color, of the most intense ruby or blue for sapphire, together with brilliancy and weight. The ruby and sapphire are formed on an aluminum base, the common emery being another form of structural arrangement, but of the same chemical constitution.

These stones possess every quality to make them the base of perfect jewelling ; and still the chrysolite is equally in favor with most jewellers. It is not quite so hard, but it is more easily worked and cheaper in price, and it would be difficult to tell wherein it is inferior to either the ruby or sapphire. It has a yellowish tinge, verging to the color of the olive. As a stone for jewelry it is not fashionable, and only in Persia is it valued. There are, however, some very strong objections to its use by the workman : it is not uniform in hardness ; in polishing it will *drag*, that is, the surface will tear up in the process. Unfortunately the eye is not able to detect the fault before working, and it is found only when much preliminary time and trouble has been expended. It is susceptible, when good, of a perfect polish, and is much used in chronometer work, especially for jewelling the 4th hole, as its non-liability to fracture renders it valuable.

"Aqua Marine" is a brother to the emerald, differing from it only in intensity of color, and composed of the same constituents. These two gems are the only ones in which the rare metal, glucinum, has been detected. It is extensively used in the American and English watches, but never in the Swiss. It is soft, not much harder than quartz, but comes in large pieces, perfectly transparent, and of a color which is that pure green of sea-water, from which it takes its name, "Aqua Marine."

The garnet in English watches plays an important part for pallets, also for roller-pins ; a very soft stone, but very porous. When set in the pallet with a pointed toothed wheel, it is apt to act as a file from its porosity, cutting the end of the tooth. This may be detected in any pointed tooth lever watch, by observing the color of the back of the tooth. "Black vomit" it used to be called in the Boston factory. Most of the garnet used is an oriental stone, the best quality coming in bead form, the holes having been pierced by the natives. The cost of piercing the stone in Europe or America would be far above its value. The Oriental is the best for Horological purposes, though Hungary and Bohemia furnish the most highly prized stones used for ornamental purposes ; indeed, in some German towns, the cutting and setting of the garnet is a specialty, giving employment to a large number of people. And, strange to say, the best market for their sale is the United States.

This comprises about all the stones used in watch and chronometer jeweling. Still in clock work the pallets are generally jewelled in agate, a stone not at all suited to the purpose, it having, even in the best specimens, a decided stratification that prevents a uniform surface being formed by any process. The cornelian form of the agate is not open to this objection, and makes capital bearings for knife edges of fine balances, and compass stones for centres of magnetic needles. For watch or chronometer purposes the only really useful stones are sapphire, ruby, chrysolite, and aqua marine—all possessing peculiarities that deserve some remarks, as they are of the utmost importance to the hole maker. The sapphire is the hardest stone, next to the diamond, and yet specimens can be, and are found, so soft as to *drag* in polishing. Again, if stratified very clearly, will "fire crack" in opening the hole. The ruby is more uniform in its structure, and is more highly prized on that account ; its hardness being all that is necessary, while its susceptibility of receiving a high polish is equal to that of the sapphire or chrysolite. The aqua marine is always uniform, and may be polished both externally and in the hole with "tripoli," saving something in diamond powder in the process of making. In our estimation, however, the chrysolite is the most valuable of all the stones. True, when purchased in the rough, many pieces will be found unfit for the jeweller's purpose ; but when the right quality is found, nothing can be better adapted to jewelling. Hard, it is easily wrought, taking a peculiar *unctuous* polish, retaining oil in its most limpid condition for a long time.

These stones form the general stock by and from which jewels are made. The details of the various manufacturing manipulations, the tools used, also the setting in the work, together with the important item of the screws, will form the subject of the next article on Watch and Chronometer Jeweling. Not having been able to get our engraving done in time for publication, we are compelled to reserve the remainder for the next number.

Proceedings of the Horological Club.

A Distinguished Body of Watch and Clock Makers.

Fifty-fifth Discussion.—Communicated by the Secretary.

[Notice.—We shall be pleased to receive descriptions of improved tools or ways of working, useful information, suggestions for bettering the condition of the trade; also, letters asking for for any information that may be desired in our line. Correspondents should write all letters intended for the Club separate from any other business matters, and headed "Secretary of the Horological Club." Direct the envelope to D. H. Hopkinson, Esq. *Write only on one side of the paper*, mail as early as possible, as it must be received here *not later* than two days before the end of the month in order to be discussed and reported in the Circular for the next month.]

READY-MADE PIVOT DRILLS.—THE ADJUSTMENT OF ESCAPEMENTS.

Secretary of the Horological Club:

I see in the Circular for February, 1878, an article on pivot drills; something of the kind has long been the want of the trade, and I hope you will succeed in getting them in the hands of some one who will supply the trade. Would like very much to get a set as soon as possible. In regard to the Circular, will say that I am more than pleased, and the articles on repairing in the proceedings of the Horological Club, are more than worth the price. I should like some good practical workman to write a few articles on the adjustments of escapements, in good plain language such as any one can comprehend. I find that most of the cheap watches are poorly adjusted, and what is wanted is some method to right them at a small expense, as the owners will very seldom pay for a new escapement. J. H. S.

Mr. McFuzee would inform J. H. S. that the pivot drills spoken of can be obained of the publisher of the Circular at $3 per set of 126 drills, of 21 different sizes, from the smallest used up to those suited for drilling center pinion pivot holes, or for small jobbing. This also includes two drill-stocks, and all contained in a neat box. As they are made from Stubb's steel wire, are all hardened, tempered and sharpened, ready for use, the price is certainly very cheap, to say nothing of the convenience of having a full assortment of sizes and the best quality of drills.

As for adjusting the escapements of watches by some quick method it cannot be done. There is only one way to adjust an escapement, and that is to test all the different parts, to see if their forms and actions are correct; and if not, to either make them so, or put in new ones that are right. Cheap watches will seldom pay to bother with, if their escapements are made much wrong. There is no patent way of doing such work, nor any way of doing it at less expense than it is worth. If the watch requires a new escapement it must have it, no matter how cheap, or it cannot be made right at all. Mr. S. will find, in Excelsior's Practical Hints, the best directions for testing and adjusting escapements yet published in English. They are written in plain language, that any workman of ordinary intelligence can understand, and are thoroughly practical. They show how the escapement should be to produce the best results, how to find if they are so, and if not, how to make them so, either by altering the old parts, or by putting in new ones. He did not know of anything equal to them, or like them in their method of treatment. And any workman who will begin at the beginning, and carefully study the directions, ought with proper skill to meet with success. The articles on the four principal escapements, the cylinder, detached lever, duplex and chronometer, begin, he believed, in the latter part of Vol. VII, and continues up to the middle of Vol. IX.

If Mr. S. thinks these articles are more full than he cares for, and only wants some short rule-of-thumb that will apply to all cases, he wants what cannot be given. Circumstances alter cases, and directions which would just fit our construction, would not apply to another a little differently made or arranged, or which was out of order in a little different way. There can be no instructions of real service to workman unless they are broad enough to cover the whole ground, and then he must use some judgment and thought in applying them in practice. Such are Excelsior's articles giving enough of the principles of the escapement to show what we are trying to do, and why we do it, and then directions for practically carrying out the work. They are in fact written in accordance with the opinion of an eminent author (Hurman, in his Analytical Horology), who said, that before making an alteration, "there must pre-exist a full idea of the work to be done. It is this which establishes the scientific character of our trade over many others, and for want of which some watchmakers give it a bad reputation. The most practical man is he who has a perfect knowledge of the conditions, laws, and forces involved in a mechanical contrivance, and can properly arrange their harmonious corporation; the most practical articles are such as will assist a workman to gain such a point."

A. L. B. and W. G. ask if Excelsior has published a book on watch escapements. He has not. His articles on escapements are published only in the Circular, as just stated. He has yet published only one book on horological matters, which comprises the first series of his Practical Hints on Watch Repairing, and, from the main subject treated in them, is called A Practical Treatise on the Balance Spring and the Compensation Balance.

REMOVING SET JEWELS IN WATCHES

Secretary of the Horological Club:

I have seen a communication before your honorable body, some time ago, how to remove jewels in settings, as in the American watches. I find this to be a good way: Take a punch that is flat, hold the plate or bridge over a hole in the stake large enough to admit the jewel with setting, and tap lightly with a hammer. This does not slur the setting in the least. Would like to have the opinion of your honorable body about this. G. A. H.

Mr. Horologer thought this would do as well as the tool formerly described if the size of the punch was such that it would rest on the brass, outside of the bezel. The other tool was of brass, and fastened in a handle, but there could be no objection of course to driving the jewel out instead of merely pushing it out, if carefully done.

TURNING BALANCE STAFFS WITHOUT WAX.

Secretary of Horological Club:

For the use of P. P. H., who made inquiry in October number of Circular whether balance staffs can be turned true without using cement, I send the following, written for "The Watchmaker," by G. L. S., of Sata Paula, Cal.

"To turn a balance staff in an American lathe without wax.—First, get a piece of steel wire as near the size of the largest part of the old staff as you can, turn the part that the roller table belongs upon, finish and pivot, using a common split chuck, then cut the piece of steel off as near the length of the staff you intend to make as possible.

Second, get a piece of brass wire that will fit as near as possible one of the large size chucks. Put it in the lathe and fasten firmly: then turn the brass down until it is true, and square the end. Centre, and drill a hole the size of that part of the staff you have got finished, making the hole small enough so that you will have to drive the piece of steel slightly, then all that is necessary is to turn the staff in the usual way. If it should be necessary to remove the work, take the steel out of the piece of brass in the chuck, or you will lose the centre. By following the above directions, the work can be taken out and put back as often as may be necessary before finishing the job."

I will only add that I have tried the above, and can put in a staff as true as possibly can be done by wax, and in less time, and can use any lathe, whether the chucks are true or not, if it will only turn. The only care required is not to let the brass be moved in the chuck until the job is done. Any one never having tried this will be astonished how nice a job they can do by this method. J.

Mr. Waltham said that was a well-known method of turning in balance staffs for English levers, and was a very good one when well carried out. The great trouble was that the steel part, or staff proper, was continually getting loose in the brass, and would turn in it, or let the balance work up or down on the staff by handling, etc. If not well fitted in the brass, any attempt to tighten it would probably throw the balance out of true. Still, if skillfully done and well fastened, no objection could be raised. But in the Swiss and American levers, in which the balance staff, collar and all, was made of steel, the substitution of a brass collar would seldom answer, because it required to be turned down so thin, that it would not be substantial enough, and the job would disappoint the workman. Even in movements where this would not be the case, a brass collar would have a cheap look, evincing a desire to do the job as easily and cheaply as possible—in short, a job that a thorough workman would be

ashamed to acknowledge. Very likely "G. L. S." and our correspondent "J." referred only to English lever balance staffs. But it was necessary to have this understood, and not let the method go out as being the proper thing to do with all lever watches.

Secretary of Horological Club:

Will some one of your honorable body please give us something in detail of the way to bush brass jewel holes properly? What tools are used, and what the best material to employ? A. S.

Mr. McFuzee presumed that this correspondent meant "brass pivot holes." The ordinary broaches are used to ream out the holes, which are then tightly plugged up with hard brass of good quality. If jewels are to be set in them, the bezels, seats, etc., are cut either in a lathe, or with some of the jeweling tools in market. The way of finding the place for the new pivot holes is given in Excelsior's Practical Hints; if not very fully in one place, it has probably been described at greater length in some previous article.

A WATCH MADE OF WOOD.

Secretary of the Horological Club:

Find enclosed a notice of a watch that I have just finished.

Yours, &c., E. A. JOHNSON.

Mr. E. A. Johnson, jeweler, with the well-known establishment of A. Picken, of Abingdon, Va., has been at work recently on a watch. He has manufactured a watch from beginning to end out of wood, consisting of three kinds, box-wood, lignumvitæ and ebony. Every wheel, case, rim and screw, everything about it, excepting the spring and hair spring, he made himself of the wood—not excepting the finely cut threads on the screws and in the sockets in which they belong. The case, rim and plates are all minutely made and prettily carved, displaying a skillful workmanship we have never seen equalled. Other wooden watches have been made in this country, but had in them brass wheels or rivets, or some other parts metal. This is all genuine wood, and caps the climax in the wooden watch line. It keeps good time, is durable and pulls the immense weight of three quarters of an ounce. It is worth seeing, and can be seen at any time at the jewelry establishment of Mr. Johnson.

Mr. Regulator observed that such a watch would indeed be quite a curiosity, and serve as an advertisement, but he thought it was to be regretted that so much ingenuity and skill should not have been expended upon some more durable and worthy material, or in constructing the finest possible grade of time piece.

BEATING THE BOTCHES.

Secretary Horological Club:

As the boys are all sending in their plans as to the best method of quenching the botches, I will now submit for consideration my plan, which is, that you select from your club a committee to act as an examining board, who shall prepare blanks with questions similar to those suggested by N. R. H. in CIRCULAR of January, and give notice in the CIRCULAR to all watchmakers that said blanks will be forwarded to all by remitting (say 15 cents) enough to pay for postage and blank. At the same time, state the object and plan. The blank to be filled out by answering the questions and returned to the committee, with at least three samples of the petitioner's work, (a list of work given in the blank to select from), together with an affidavit that the samples are the petitioner's own work, sworn to before a magistrate. If the petition and work shall prove satisfactory, the petitioner shall pay a certain sum (say $5) sufficient to pay all expenses and trouble the same may incur. On paying the amount stated, a handsomely arranged diploma to be given him, which he can frame and hang up in his place of busines. Then furnish the almanacs, as proposed by Mr. Waltham in CIRCULAR of December, with this addition: Print therein a list of all the watchmakers that received diplomas, and been pronounced good workmen, also that heen rejected, etc. The almanac to be renewed each year, and all new names added. This will do away with the botches getting the almanac The more they circulated them the worse it would be for them. Let the almanac be free to all, by paying enough to defray expenses, and those that purchase may advertise their business at a small cost and the publisher thereby get a fair compensation for the almanac. This, in my opinion is the only method to check the botch and help the good workman. You must not expect to entirely do away with the botches, any more than the farmer can do away with the potato bugs; but like him, we can put Paris green on them, and prevent them destroying the whole crop, and I think this plan comes as near the Paris green as anything can be got.

C. M. C. some time since asked for some one to give in detail the method of turning in a balance staff. If he wishes it for foot lathe, I think I can accommdate him. F. A. GRISWOLD.

Mr. Horologer said that this plan had some good points, which were well set forth by Mr. Griswold, but it also has its weak ones. The committee must be composed of men well known to the trade, and having their confidence, and such men must be well paid for their time. The best suggestions for that, thus far, were two. One was to have the examinations made and the certificates signed by the faculty of the Horological School. As that project was at present under a cloud, with poor prospects of being carried out, the next best proposition was to have a committee selected by the trade at large for that special purpose. Then perhaps it would be difficult to agree upon the precise kind and amount of knowledge required, the particular questions and kind of work to be made the *sine qua non*, which should prove one to be a good workman. Besides swearing that the specimens of work were done by him, he should swear that the questions were answered by him without being coached by any one else or something of that kind. The publishing of the names in the almanac is a good idea, and removes the objection that the botches might use the almanac. But if any considerable share of the trade should adopt the plan, the list of names would take considerable space, and add to the cost or lessen the amount of matter printed.

Mr. Horologer thought the principal difficulty would be to get a committee which would command the respect of the public for its certificates, and of the trade, sufficiently to compel ALL to take certificates. Some might say they were well enough known to be good workmen, and did not need any such papers. Then the botches would point to them and say, "Messrs. So-and-so have no certificates, and everybody knows they are good workmen, and we don't think it necessary for *us* to take the trouble to get one. If that was the rule, we would do so, but only a few beginners, etc., are getting them, and the thing don't amount to much, anyhow—just got up for somebody to make money by it." All this would look very reasonable to their customers, and quite likely they would make it appear that they were above needing any such help, or that it was not worth having.

He wished it understood that he was not finding fault with the plan, but merely pointing out the weak spots, in the hope that some one would be able to remove them, and so perfect the idea as to be unobjectionable, and to commend itself for adoption. Let us hear from Mr. G., or any one else who can give us ideas on these points. If Mr. G. can give us the method specified by Mr. C. W. C., and afterwards stated by Mr. Horologer at the January meeting, we should be pleased to receive it, either for the foot or bow lathe.

OILING WIRE.—MILLER'S SILVER WHITE.

Secretary of the Horological Club:

In "Use of Oiling Wire," &c., in the October CIRCULAR, I do not wish it understood that the phial spoken of is for keeping the oil in. It is intended for the oiling wire only; therefore it does not require any holder or base, as suggested by Mr. Uhrmacher. I keep the oil for immediate use in a boxwood cup with agate center, which I prefer to a glass one, as it excludes the light, and this "Excelsior" tells us is important. An old watchmaker that has a good name told me that he used Miller's Silver White for cleaning movements. Need I be afraid to use it on the finest work? M. A. M.

Mr. Uhrmacher thought that, even if the phial was only used for keeping the oiling wire in, it would be a good idea to have it fastened in a base or holder, so that the wire could be easily taken out and replaced with one hand. That is very often a great convenience. He thought another good idea would be to have the cover of the oil cup work with a hinge, so that it could be thrown up with a touch of the finger, the wire dipped in, and the box closed with another touch. It would save time and trouble, and insure the oil being kept covered, as it would be closed up many times where the common box would be forgotten, or left open to save trouble. Miller's Silver White, if genuine, he thought could be safely used with care, but the finest work is generally cleaned without using powders, but simply washed with pure soap and water, and very lightly buffed, if necessary.

THE TWO-BALANCE WATCH.

Messrs. McFuzee, Isochronal & Co.:

A NEW TEST FOR WATCHES.—When two one-balance watches are regulated to tick as if one had stopped (which is easily done when they are both at rest), you cannot carry one across the street and back, say 1-5 second, as is proved by the alternate beat which you bring back. Now, gentlemen, do you see where you are with your perfection?" If you doubt this detail, try it and report. Perhaps the "two-balance" watch does the same thing—across the city or back. Like man, the watch does wonders, when the circumstances and opposition to the laws of Nature are considered. In proportion as you *acquaint* the patrons of your art with the *nature* of things, you get more or less trouble with them; hence in America the watch factories do not undertake the pocket chronometer, only the pocket watch known as the "ordinary useful work." The one-balance watch as *now* made costs an immense amount of vitality—grinds (!) down the finest artists, in a regular mill. "Nix for ungude."

J. MUMA.

Mr. McFuzee, as the senior member of the firm addressed, replied that we do not claim "perfection" for anything made by human hands. But Mr. Muma is in error in saying that the American factories do not undertake the pocket chronometer. The Waltham and Howard Watch Companies both make watches equal to any pocket watches made anywhere. He would suggest that Mr. Muma should send the Club one of his two-balance watches for examination. We would like to know what there is of it, and of course we cannot be expected to admit its superior qualities without seeing and trying it.

EXCELSIOR'S BOOK.

Several correspondents, having noticed our remarks on Excelsior's book at the last meeting, write asking the price, and where published. This information has been repeatedly given before, but as these inquirers may be new subscribers, we again state that it comprises the first series of his Practical Hints on Watch Repairing, is published by the publisher of the CIRCULAR, and will be sent by him to any address on receipt of the price, $3.50. A synopsis of contents is given in the CIRCULAR for September, 1877, and discussions and commendations of it by the Club in our proceedings for February, April, August, and October, 1878.

THE DIPLOMA AND ALMANAC PLAN.—THE WHOLESALE SNEAKS AGAIN.

Secretary of the Horological Club:

Has the "Horological Club" gone to sleep on the diploma and almanac question? Let them wake up and set the ball rolling. A diploma, I think, will pay us country watchmakers well, as a great many people will send their work to the city, because the skill of the country workman is doubted, just because he lives in the country. He is looked upon by many as a somebody, who had to come to a small place in order to keep from starving in the city.

Chicago's price lists and catalogues have made their annual appearances on the counters of dry goods and grocery stores in larger abundance than ever. Besides, I was shown by our P. O. clerk a circular by which he induces such clerks to give him all the names of farmers and others of means, to send his catalogue to. Can nothing be done to stop it? It is just completely and effectually ruining the country jewelry trade. We in small places cannot afford to buy any jewelry whatever, because everybody sends for their own goods, or buy them in the dry goods stores. H. C.

Mr. Clerkenwell assured H. C. that the Club had not gone to sleep, but had done all it could to bring the subject before the trade, leaving dealers to take such action upon it as they choose. As explained in several previous discussions and particularly at the close of his remarks at the meeting for last August, the Club is not so constituted that it can do these things for the trade, and any attempt to do so is disapproved by the members, as entirely foreign to the objects of the association. The trouble with the trade is that they want to lean back at their ease, and have *somebody else* do everything for them, while they calmly criticise and query whether it will suit them to have anything to do with it or not. But they will wait in vain. These things will never be done till they take hold themselves and work for them.

Supposing that a reasonable share of the trade really wish to undertake the work, the question is, how shall they go at it? The almanac part of the plan ought to be easily managed, by each dealer subscribing $5, $10, and upward, for them, being entitled to a proportionate number of them when printed. If encouragement enough was offered in this way, some one would come forward and get them up. If there was no inducement to pay for the trouble, nobody would trouble himself about it, and that would be the end of it.

The diploma part, although even more important, would be more difficult. Who shall issue the diplomas? Who shall examine the applicants? What shall be the standard of knowledge and skill to entitle the workman to a diploma? All these things must first be settled to the satisfaction of the trade. The Horological school would have been the best agency for doing this work; but we do not seem likely to get any Horological school very soon. And probably Excelsior would have been able to propose an examination programme, etc., that would be generally acceptable—but that too is out of the question, as he is debarred from doing it by the impossibility of giving it the necessary time. The Club cannot do it, as already explained, for, on any attempt, the Club would probably go to pieces by the secession of members who think that is not in our line. What shall be done? Let L. C. and others study up the matter, and if they can hit upon any possible plan, send in their suggestions.

As for the wholesale sneaks, the only cure we can think of is for the retail trade to refuse to ever purchase another dollar's worth of goods from any wholesale house that sends out catalogues and prices to parties outside of the regular trade dealers. But that would only deprive them of the custom of the few retailers who might actually catch them at their dirty work. To make the plan more effectual, these dealers should publish the names of the sneaks they detect, for the information of the rest of the trade, so that all might know whom to avoid as common enemies. We would suggest that every dealer who learns of such catalogues being received by outside parties, take it upon himself to inquire into the case, so that he can back up his statements, under oath if required, and report to us the full name and address of the offenders, and of the parties to whom the catalogues were sent, with the line of business followed by the latter, and whether the catalogues or prices were applied for by them, or were sent without their request.

What we mean is that he shall hold himself responsible for the accuracy of his statements, or otherwise no one would care to publish the offender's names. As R. C. says, and we all know it, these men are ruining the trade of country dealers, and it becomes a matter of life and death to put a stop to the practice. If all dealers will combine to report every such firm, and to do no business with any firm so reported, it will be possible to confine their trade altogether to chance outsiders, and so starve them out. We hope they will do so, and we promise our co-operation. But if they will not—if they choose to sit supinely and see the ground taken from under their very feet, they deserve to lose their trade, as they probably will. And any dealer who will afterwards patronize a house guilty of this practice, and thus lick the toe that kicked him, ought to starve.

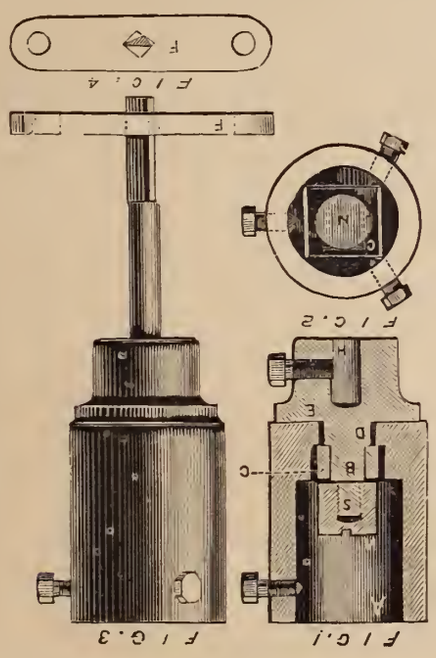
The Club then adjourned, leaving several letters till next month.

THE first precious stone reproduced, not only in its appearance but its real nature, and in all its component parts, is the lapis lazuli, the sapphire of the ancients, not to be confounded with the sapphire of our modern jewelers. This untransparent stone, of a magnificent azure-blue color, was most highly prized by the ancient Hindoos, Assyrians, Persians, Jews, Egyptians, Greeks, etc.; and this irrefragably refutes the erroneous theory of some archæologists that the ancients were unable to distinguish the blue color. When pulverized, this stone furnishes the surpassingly beautiful ultramarine color with which the artists of the middle ages delighted to paint the mantle or gown of the Virgin Mary, although they had to pay the most extravagant prices for the pigment, which they always charged in the bills of those who had ordered a sacred picture from them. Some fifty or sixty years ago, Gmelin, the German chemist, discovered that this most beautiful of blue colors could be artificially produced by heating argillaceous earth with soda, sulphur, and carbon; and now that Guimet the French chemist, has practically introduced this process, Europe manufactures annually about 100,000,000 pounds of this pigment, most of which is produced in Germany.—*Carus Sterne, in Popular Scientific Monthly for September.*

Drilling Square Holes.

TO drill a square hole with a rotary motion at one operation may seem to many a novelty in mechanics, but Mr. J. Hall, of Chancery Lane, has obtained a patent for a method of accomplishing the feat. For this purpose he employs a three-sided drill, either flat or fluted, which, in cross section, is of the form of an equilateral triangle. He makes the bottom or cutting edges of the drill perfectly flat, and three in number, each cutting edge extending from one of the outer corners to the center of the triangle. The proposed method of using such drills in an ordinary vertical drilling machine is as follows: A special drill chuck, forming part of the invention, is provided, and attached to the lower end of the drilling spindle. The chuck is constructed in such manner as to admit of the drill traveling automatically in a horizontal plane some little distance. This is rendered necessary by the peculiar movement of the cutting edges of the drill, which does not operate or rotate on a fixed central point, but diverges somewhat in proportion to the size of the hole.

The deill chuck is constructed in the following manner: The upper part of the cavity of a metal cylinder is bored out circularly, so as to fit on to the drilling spindle, to which it is screwed by one or more screws. Below the circular bore a square recess is made, and below this latter, and coming well within the limits of the square recess, there is a circular hole passing through the end of the cylinder. The drill holder or socket is in a separate piece, the bottom portion of which is provided with a square or round recess for holding the shank or upper end of the drill, which is held firmly in its place by means of a set screw. The device is shown in the accompanying engraving, which we take from the *English Mechanic*. The upper part consists, first, of a screw, S, at the top, Fig. 1; secondly, of a



square shoulder, B; thirdly, of a circular shoulder, D; and fourthly, of another but much larger circular shoulder, E. Through the circular hole at the bottom of the hollow cylinder the upper portion of the drill holder is inserted until the large circular shoulder meets the bottom of such cylinder. A loose square collar; A (Figs. 1 and 2), provided with an oblong rectangular slot, is then placed within the cylinder and over the square above mentioned, above and on to which is screwed down a nut, N, from the inside of the cylinder. The loose square is of such thickness that when the nut is tightened down on to the square shoulder the loose collar is left to work freely. When this is done the drill holder will readily travel in a horizontal plane such distanee as the play between two of the sides of the loose collar and two of the sides of the square recess, in one direction, and in another direction the distance of the play between two of the sides of the small square shoulder of the drill holder and the ends of the rectangular slot in the loose collar. The horizontal travel or play is proportionate to the size of the hole to be drilled. Near to the lower end or cutting edges of the drill is fixed rigidly a metal guide bar or plate, F. The guide bar is provided with a square hole similar to thc hole it is reqired to drill, the dimensions of the three sides of the drill being such that the distance from the base to the apex of the triangle, which such three sides form, is the same as of the sides of the square holes it is required to drill.

Mr. Hall prefers to make the guide bar of steel, which he hardens at that part where the guide hole is made. The method of operation is then as follows: The three sided drill being fixed in the self-adjusting chuch, the guide bar with the square guide hole therein rigidly fixed above the point where it is required to drill, the drilling spindle carrying the chuck drill is made to revolve, and is screwed or pressed downwards, upon which the drill works downwards through the square guide hole, and drills holes similar in size and form to that in the guide. The triangular drill for drilling dead square holes may also be used without the self-adjusting drill chuck in any ordinary chuck, when the substance operated upon is not very heavy nor stationary; then, instead of the lateral movement of the drill, such lateral movement will be communicated to the drill by the substance operated upon.

Although the patentee only cites the case of a vertical drilling machine in connection with this invention, he declares that the specified improvements are equally applicable to lathes, ordinary braces, ratchet braces, and all other descriptions of drilling apparatus. In making oblong dead square cornered holes, either the substance to be operated upon must be allowed to move in one direction more than another, or the hole in the guide plate must be made to the shape required, and the drill chuck made to give the drill greater play in one direction. Fig. 1 shows a vertical section of the improved chuck, in which A is the hollow cylinder, which may be attached to any ordinary drilling machine; H is the drill holder; S is a screw; B is a square shoulder; D is a circular shoulder; E is a circular shoulder of a larger dimension; N is a screw nut for tightening on to the square shoulder, B, and the loose square collar. Fig. 2 is a plan view of Fig. 1. Fig. 3 is an elevation of the improved chuck; C showing the three-sided drill and the guide bar, F, complete. Fig. 4 is a plan of the guide bar, F, showing the three sided drill in cross section.—*Scientific American.*

Horology.

WHAT should we do wishout clocks and watches? Is there anything comparable to the misery of being benighted on a country road with a watch that has stopped in one's waistcoat pocket, and not a clock within view to tell one ihe time? The sun has set, every minute's tramping on the dusky, murky road seems as an hour. We have a train to catch, a dinner to be in time for, or a district meeting to attend, at which it won't do to be late. On ordinary occasions, when cool and collected, we might be able to compute the time, but in straits like these our reckoning deserts us. It may be five, or six, or seven, for all we know; we should not be surprised to hear it was eight. Our notions get muddled, and on we trudge, breathless, nervous, and irritable; pretty certain, too, to find in the end that we have been fretting ourselves for nothing.

But it is of no use asking how we should get on without clocks and watches. The timepiece may almost be said to be the mainspring of civilization. It is so intimately connected with all our wants, it is so completely the regulator of all our occupations, that we have become, as it were, its slaves; and we can no more imagine a state of social existence wiihout it, than we can imagine birds flying without wings, or any other thing that is totally impossible.

The first people who appear to have allotted the day into portions were the Assyrians, who Invented a water-clock at a period too remote for precise calculation. All we know for certain is, that the apparatus existed before the overthrow of the first Assyrian empire

by Arbaces and Belesis, in the year 759 B. C., for we find by the tradition of early Persian authors that the use of it was general in Nineveh under the reign of Phul, better known as Sardanapalus the Second, the first monarch of the second Assyrian empire. This water-clock was nothing more than a brass vessel of cylindrical shape, holding several gallons of water. A very small hole was bored in one of its sides, through which the liquid was allowed to trickle; and it was calculated that the vessel could empty itself about five or six times in a day. Under the reign of Phul, the royal palace of Nineveh, and each of the principal districts of the city, possessed a water-clock of the same shape and capacity. They were filled together, or as nearly as possible together, at the signal of a watchman starioned aloft on a tower to proclaim the rising of the sun, and they remained all day in the keeping of officials, whose business it was to fill them as soon as they became empty. There was a regular staff of criers employed in connection with each of the time offices, and as often as the water-clocks were replenished they spread through the streets shouting out the fact for the benefit of the townspeople. In this way a sort of rough computation of the flight of time was held. The intervals between the filling and emptying of the vessels were called "watches," and were, probably, of two hours or hours and a half's duration. But it is hard to suppose that the water-clocks kept very steady pace with each other; the difficulty of making by hand vessels of the same size, of drilling them with holes of precisely the same diameter, and of supplying them with water of just the same density, must have given rise to even more irregularity in the working of these machines than exists at present in the movements of our city clocks—those clocks of which Charles Lamb said that they allowed him to walk from the Strand to Temple Bar in no time, and gain five minutes!

The water-clock, or clepsydra, continued to remain in its primative condition for many centuries; and it was not until the invention of the sun-dial at Alexandria, five hundred and fifty-eight years before Christ, that it underwent any improvement. About that time, however, an Egyptian of Memphis added a dial with a hand to the clepsydra. The hand revolved on a pivot, and communicated with a string which was fastened to a float. As the water leaked out, the float fell with it, and the tension of the string caused the hand to move round with slight spasmodic jerks, something like those of the second-hand on a watch of inferior make.

This reform, meritorious enough in theory, proved somewhat deficient in practice; for the old difficulty about getting the clocks to keep step was doubled or trebled when the system became complicated with dial, needle, string, and float. To insure simultaneous acting, the string or wire of the different clocks ought to have been of the same length and force; the needles also ought to have been of a size and set on pivots exactly similar in point of height and circumference. And when all this had been obtained, there was still the question as to how to make float and string, string and needle, act in perfect unison. Often, through rust, or some other cause, the needle must have proved obdurate to the faint tug of the string, and the float, in consequence, have remained suspended in mid-air; whereupon, of course, the dial became mute, and Egyptians, who dislike innovations, must have shrugged their shoulders. But, notwithstanding its drawbacks, the improvement was a very valuable one, if for no other reason than that it prepared the way for further changes, and led to the perfecting of the clepsydra by the substitution of a system of dented wheels for that already in use. The wheels were set at work on the water-mill principle, and the addition of a second needle to the dial allowed the clock to mark the fractions of the different "watches." This was the *ne plus ultra* as far as the clepsydra was concerned; it dates from two hundred and fifty yearr before Christ, and Egypt, which had become the great mart of the new timepieces, exported them to the different countries of the East as rare curiosities and at fabulous prices. When Pompey returned to Rome, in the year sixty-two before Christ, from triumphing over Tigranes, Antiochus, and Mithridates, one of the most valuable trophies he brought with him from the treasures of the King of Pontus was a clepsydra, marking the hours and minutes according to the method of horology in use at Rome. The cylinder which served as receptacle for the water was of gold, as was also the dial-plate. The hands were studded with small rubies, and each of the ciphers that denoted the twenty-four hours was cut out of a sapphire. It must have been of enormous size, for the cylinder only needed replenishing once a day. The Romans had never seen anything like it, and when Pompey caused it to be set up in the chief hall of the Capitol, it needed a strong guard of soldiers to protect it against the indiscreet curiosity of the mob.

We come now to those ages of total darkness which followed the overthrow of the Roman Empire when science, art, and everything that was refined fell into contempt and oblivion. The barbarians who conquered the imperial city had very primitive modes of marking the course of time. They knew nothing about hours and minutes; they had not sense enough to invent water-clocks and sun-dials, even had they been acquainted with them, would have served them but little in lands such as theirs, where the sun only shone on rare occasions, and where cold, fog and rain held sway for half the year.

However, it was necessary that they should know when to prepare their meals of half-cooked meat, when to gather in circles to listen to the preaching of their druids, and when to relieve the sentries who mounted guard on the outskirts of their settlements; and so this is what they imagined. At the break of dawn, when the chieftain of the camp or village rose, a boy-slave came and took up his position at the entrance of his hut, and sat down with two helmets, one full of pebbles and the other empty, before him. His business was to transfer the pebbles, one by one, and not too fast, from the first helmet to the second, after which he surrendered his turn to some one else, who repeated the operation, and so on till dusk. As the helmets were mostly very big, and the pebbles, on the contrary, very small, the process of emptying must have taken a good two hours. It is probable, therefore, that the days of these Franks and Norsemen, Teutons and Vandals, were divided, like those of the Assyrians, into six parts or watches. As soon as a helmet had been emptied, the fact was proclaimed through the camp by the striking of a sword against a shield, gong fashion, at the chieftain's door. The echo was caught up around, and men knew that dinner-time had come.

But this was not the only method of marking the time. There were other ways, which differed according to the locality and the various pursuits of the people. In peasant districts, the laborer reckoned by the number of furrows he could plough, or, if it was harvest time, by the quantity of corn he could reap. In towns, where some faint remnant of Roman civilization survived, the reckoning was kept by watchmen. At daybreak a soldier started on foot (or, if the town was a large one, on horseback) to walk round the city. When he had gone his round, the first watch was over; and he returned to his quarters blowing loud on a trumpet, whilst a second soldier set out in silence to perform the second watch. This continued uninterruptedly day and night, the only difference being that sunset there was no trumpet-blowing, and that the watchmen, instead of proceeding singly, went their rounds in batches of ten or a dozen.

Finally, as a last instance of barbarous chronometry, we may allude to the method employed in monasteries, the first of which, founded by St. Benedict, was instituted at the beginning of the sixth century (A. D. 523). The monks were in the habit of computing time by the number of prayers they could gabble, and it was hence that the custom of wearing chaplets of beads arose. The task assigned to each monk was to recite as many "paters" and "aves" as there were beads on his string, and as the orthodox number on the chaplet was supposed to be then, as it is now, thirty-three—that is, one for each year of our Saviour's life—there was work for a full hour and a half, if conscientiously performed. As in the case of the urban whtchman, one monk was relieved by another, and the termination of each "vigil" was notified to the community by the tolling of the chapel bell. We may add that this custom continues unaltered in certain monastic establishments. In monasteries of a severe order there is no such thing as a clock to be seen. The only timekeepers are the shorn, becowled monks kneeling in perpetual adoration.

A century after the final overthrow of the Roman Empire, the habit of reckoning by hours and minutes had completely disappeared from Western Europe. One by one every vestige of art and science disappeared, and, had it not been for the kingdoms of the East, which kept the flame of science just flickering whilst the West was in darkness, our present system of horology would have fallen into complete abeyance. It was the famous Caliph of Bagdad, Haroun-al-Raschid, who restored the old water-clock to Europe. In the year 807 he sent a magnificent clepsydra as a token of friendship to Charlemagne; but it seems that the present was looked upon as a thing to be rather admired than copied, for we find no mention of any water-clocks of French make until the reign of Philip, contemporary of William the Conqueror. Perhaps the reason of this is that the sand-glass (sablier) had been invented in France shortly before the accession of Charlemagne, and that this last contrivance was judged more handy and simple than the other. The first sablier was made by the same man who reinvented the blowing of glass, after the secret had been lost for some centuries. He was a monk of Chartres, named Luitprand, and the sand-glass he made was the exact prototype of all those that have been manufactured since. It consisted of two receptacles of pear-like shape joined by their slender ends. When the sand had all run out from one into the other, the lower glass was turned uppermost and kept in that position till empty. Shortly after he had received the gift of Haroun-al-Raschid, Charlemagne caused a monster sablier to be made with the horal divisions marked on the outside by thin lines of red paint. This was the first *hour*-glass. It required to be turned over once only in twelve hours, and if it was blown with anything like the care which modern hour-glasses are, it must have kept time with as much precision as the best of lever clocks. Indeed, it is not rare to hear people declare, even nowadays, that the hour-glass is the best timepiece that was ever invented.

Whilst France was thus showing to the front in matters of science, Old England, with true conservative instinct, was still marking time in a host of antiquated, inconvenient ways. Neither did our ancestors betray any greater disposition to adopt the French inventions than we do in these days when it is a question of taking up some good reform that comes to us from abroad. King Alfred, who reigned from 872 to 900, must certainly have heard speak of the hour-glass; it is even very probable that he possessed one of his own, for the monks and pilgrims, who were continually traveling to and fro between England and France, would not have allowed a whole century to elapse, without bringing a specimen of the new invention to this country. And yet Alfred devised a method of computing time by means of a rushlight set in a lantern. Anything more unsatisfactory and more expensive than this it was impossible to imagine. A rushlight, in those days, must have cost two or three pence of our money; and, as the process of refining tallow had not then been discovered, there were no means whatever of reckoning how long one of these luminaries would take in burning. One might very well flicker and splutter for an hour, whilst a second was just as likely to flame away in ten minutes. It was not till the reign of Edward the Confessor (1041–1066) that the use of the hour-glass became pretty general in England; and the first water-clock seen in that kingdom was one brought from France by Richard Cœur de Lion, a few years before he ascended the throne.

We must now skip two centuries, during which horology made no sensible progress, and come to the reign of Charles the Fifth of France, when the first real clock was set up. This was in the year 1874. The maker was one Henri de Vic, an Arab, who had been converted to Christianity. This clock was a monster machine, weighing five hundred weight. It was moved by weights, was possessed of a horizontal lever, and provided with a bell to toll the time. There is a full description of it in Froissart. It was put up in the round tower of the royal palace (now the Palais de Justice), and attracted enormous crowds every day for several months after it had been erected. The maker received a pension of a hundred crowns of gold for life, and was ennobled. He is the first artificer upon whom this distinction was ever conferred in France.

Mr. Jaques Guedin.

ON the afternoon of Saturday, the 9th of November, 1878, Mr. Jaques Guédin, of the firm of Ve. J. Magnin, Guédin & Co., started down town on his way to keep an appointment at this office. He appeared to be in perfect health, and the fine old gentleman never looked better in his life. Mr. Guedin called in to see Mr. John B. Snooks, the architect, at No. 12 Chambers street, and while conversing with him on some detail matters in reference to the new place of business which the firm contemplate on Union Square, dropped dead on the floor. It was a sudden and wholly unexpected attack of heart disease, and thus the fine old merchant gentleman, so long, so well and so honorably known in commercial life, passed away from the world he had so long adorned, and from those friends and connections who now deeply deplore their sad loss.

Mr. Jaques Guédin was a native of Geneva, Switzerland, where he was born on the 15th of September, 1813. He came to this country in 1831 and associated himself with the house founded in 1817 by Mr. David Magnin, the grandfather of Mr. David J. Magnin, who has for the last twenty-five years been a member of the present firm. At that time the house did business on the corner of Exchange Place and William street. Since then he has always been connected with it. In 1834 the senior member of the firm returned to Europe and the deceased assumed the management of the New York business. The firm subsequently moved to Wall street, thence in succession to Nos. 19, 15 and 2 Maiden Lane, thence to 652 Broadway, as the city developed in growth, the firm found it necessary to move to more extensive quarters.

The deceased has for a long time been the ruling spirit in the affairs of his own firm, and had also been one of the foremost members of the trade in taking action and dealing with matters of general import as they came up. He had served as President, Vice-President and Treasurer of the Jewelers' Association, and was nominated for the last named office at the recent election, but declined the honor. He was a courteous old-time gentleman of polished grace and finished courtesy, the soul of honor in all his dealings and distinguished for undeviating probity and rectitude in business. He was known by all the trade and honored and revered by all his acquaintances. We can ill afford to lose such merchants as he, and his death has cast a gloom over the entire trade. At such a time words are inadequate to express the sympathy of the community, but we would tender our deepest condolence to his bereaved family.

Mr. Guédin's funeral took place on the morning of the 12th November, from his late residence, 210 East 16th Street. There was an entire absence of any of that ill-timed pomp and circumstance of woe which is at times permitted to desecrate such mournful occasions, but the large and sorrowful attendance of his friends, and the trade evidenced most solemnly and affectingly the esteem in which the departed was held, and the place which he had occupied in the hearts of his associates. The Executive Committee of the Jewelers' Association, who had known the deceased so well in life, attended in a body to do him honor in death, and almost without exception every leading firm in the trade was adequately represented. The venerable and Reverend Stephen H. Tyng pronounced an eloquent and touching eulogium over the remains of the departed, dwelling upon his many virtues, his gentle and amiable qualities, and the purity of his life.

A mournful cortege followed his remains to Woodlawn Cemetery, where he was laid to rest in his family vault, and the murmuring of the leaves and the sighing of the winds sang his requiem.

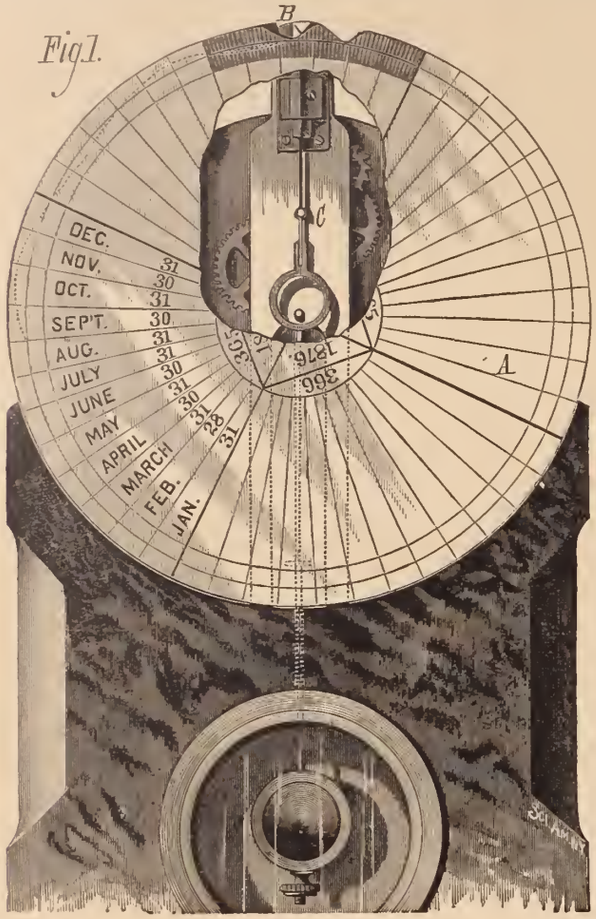
At the monthly meeting of the Jewelers' Association, held at their rooms on Tuesday, immediately after the funeral, the following resolution in reference to Mr. Guédin was adopted:

Resolved. That the members of the New York Jewelers' Association have learned with profound sorrow of the sudden decease of their much esteemed associate, friend and late President, Jaques Guédin, who, by his honorable career, his nobility of character, his scrupulous exactness in the performance of all duties entrusted to him, his zeal in behalf of this association, and his many other gentle and manly qualities has endeared himself to every member of this association. While we deeply deplore our loss, we will ever hold his name and character in grateful and affectionate remembrance.

True Time Regulator.

FRANCIS Jose Martins, of Para, Brazil, has invented a clockwork attachment by which an ordinary movement may be made to indicate the apparent or true solar time. Ordinary clocks indicate the mean time according to which the sun should pass the meridian at

Fig. 1.



noon if the sun were in the extended equatorial plane. But the sun is in the plane of the ecliptic, and the velocity of the earth varying with the seasons and proximates to the sun the true and mean solar time vary, the greatest difference being about 16 min. 45 sec. M. Martins' invention consists in so regulating the length of an ordinary pendulum that the movement goes slower or faster so that the mean time is always correct according to the equation of time. This object is obtained by the attachment of a regulating wheel A, Fig 1, as shown in the cut.

Fig. 2.

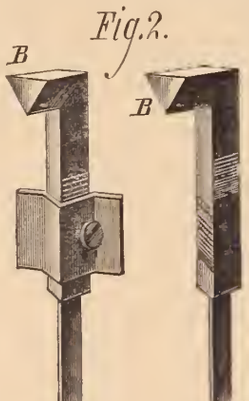
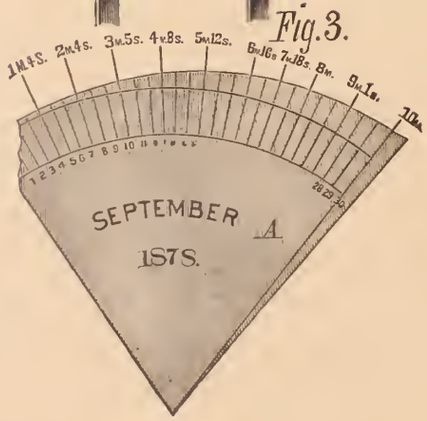


Fig. 3.



The pendulum oscilates from the pierced stand C, through which it is prolonged, and finishes with a prismatic arm B, Fig 2.

This arm is disposed so that the lower edge rests upon the rim of the regulating wheel, as shown in Fig. 1. Now it is evident if this rim were a true circle, the rotation of the wheel would not vary the time, whereas M. Martins' cuts the rim in an irregular curve, delineating the equations of time for each month during four years. Thus the section for the month of September, 1874, is shown in Fig. 3.

The regulating wheel is revolved by an appropriate train once in four years, the period when the equation of time is exactly the same, and the proper curve for each month is determined by calculation and experiment. When once ascertained the length of the pendulum, a consequent rate of going is automatically changed, and thus the result desired by the inventor is obtained. The invention may be summed up as :

"A combination of a sliding pendulum with a regulating cam-wheel, the edge of which projects beyond and withdraws within a true circle in correspondence with the increase and decrease of the true time from the mean time."

The Howard Regulator.

AS an example of the perfection to which the horological science of this country has attained, we append the following communication from Harvard College Observatory:

HARVARD COLLEGE OBSERVATORY,
CAMBRIDGE, Mass., Oct. 10th, 1878.

Messrs. E. Howard & Co., Boston:

GENTLEMEN:—The following are the errors, rates and variations from the mean rate of your mean time clock, "Howard 191," erected by you in the clock room of this observatory :

	DATE.	ERROR.		RATE.	VARIATION.
	d	*m. s.* °		*s.*	*s.*
1878.	July 24.9	—1 32.30		—2.57	—0.22
	" 28.9	1 42.60		2.30	+0.05
	Aug. 2.9	1 54.10		2.25	+0.10
	" 7.9	2 5.30		2.42	+0.07
	" 12.9	2 17.40		2.27	+0.08
	" 14.9	2 21.95		2.48	—0.13
	" 20.9	2 36.85	>	1.88	+0.47
	" 24.9	2 44.35		2.28	
	" 31.4	3 0.35	>	2.45	—0.10
	Sept. 6.9	3 16.40		2.50	—0.15
	" 9.9	3 22.80		2.13	+0.22
	" 15.9	3 37.00		2.37	—0.02
	" 19.9	3 46.00		2.25	+0.10
	" 23.9	3 55.15		2.29	+0.06
	" 29.9	4 9.80		2.44	—0.09
	Oct. 6.9	4 26.40		2.37	—0.02

Yours very respectfully,

LEONARD WALDO,
Assistant in charge of the Time Service, Howard College Observatory.

The marvelous accuracy of Messrs. Howard's regulator has never been approached, and such a record is indeed a national achievement.

MR. ALFRED H. SMITH, senior of the house of Alfred H. Smith & Co., has returned in the Scythia from Europe. His visit abroad has been marked by extensive purchases of diamonds, said to be one of the choicest selections ever imported. It will be seen by their announcement elsewhere that they have effected arrangements that will relieve their customers of all risks on goods in transit thereby saving them an important item of expense and considerable anxiety of mind.

Corundum.

WITHIN the past two years extensive developments of corundum havebeen discovered in this country, and an interesting paper on this subject was recently read by Charles W. Jenks before the Society of Arts of the Massachusetts Institute at Boston. Mr. Jenks has given special attention to the workings of this mineral, and the information contained in his paper is of great interest to the trade, as there is every prospect that the systematic and intelligent mining of our deposits will contribute to the advancement of science and the furtherance of some department of mechancical arts.

Corundum, in its granular as well as gem forms, has been known to the world from a very early period. In the first, used as an abrasive, second only in cutting qualities to the diamond ; and in gems, as sapphire, ruby, asteria, etc., nine in number, some of which to-day outrank five-fold the costliest diamonds. In fact, according to Mr. Harry Emanuel, a great authority in such matters, there is but one other corundum emerald now in existence ; it is the rarest of all gems, and the most valuable. The nature of its composition, pure alumina, giving it so much greater hardness and brilliancy, gives it this great value. The emerald of commerce from Peru and Bogota is largely silicas, of course softer and quite common. From a date as early as Solomon, the corundum gem localities have been known and worked in Armenia, Bactria, India, Ceylon, and elsewhere.

Moses, by divine command, enshrined them in permanent form over the heart of the Great High-Priest, where their brilliant scintillations, in some mode unknown to us, voiced the will of Jehovah himself.

In granular form, corundum was known to the Persians as Armenian stone ; to the Chinese as adamant ; and to the people of India as corundum, from the Hindo word *korunda*, or cinnamon stone, so called from the resemblance in color to that article of the variety found in that country. By this latter name the mineral is now generally known. It is widely scattered over the earth's surface, and yet, for more than two thousand years, used extensively as an abrasive, it has not been legitimately mined, so far as I can ascertain, until the past five years. The gems have always been sought for by similar methods in the beds of streams or on the banks of the same. This is the character of the mining to-day for both classes of the mineral in all the noted localities of the old world.

Emery, one variety of corundum, as is well known to you, is extentensively mined among the islands of the Ægean Sea, in Asia Minor, near Ephesus, and at two or three points in our own country. A paper upon this mineral, and the first where it had received thorough scientific attention, was read, some twenty-five years since, before the French Academy, by one of America's most distinguished scholars, Dr. J. Lawrence Smith, of Louisville, Ky.

Corundum is one of the most potent abrasive agents known to the lapidary.

It has been said in England that "a good mine of emery is worth more to a manufacturing people than many mines of gold." But emery is only valuable for its cutting properties ; what gives it these is its possession of forty to fifty per cent of corundum. In the scale of a hardness, with the diamond at the head as 10°, the best emery stands at 7° But corundum stands at 9°, but one degree below the hardest known substance. There is a vast and constantly increasing field of labor, which the best of emery can occupy but poorly, if at all ; and the diamond, even with the great influx from South Africa, is much too expensive for general uses. But very close upon it comes corundum, which can be supplied in quantity and but little above the price of emery, and in all the forms in which that mineral is used.

One form of tool of recent invention is the wheel made by Mr. F. B. Norton, of Worcoster, Mass., of nearly pure corundum, and which he calls the "Sapphire wheel." It runs and does its work equally well, wet or dry ; water, heat or acids have no perceptible effect upon it. It cuts cast-iron, scale steel, chilled iron, any alloy, granite, etc., with much freedom. One of its best tests is the bringing of a steel tool rapidly to a cutting edge, without heat or loss of temper. This is due to its free cutting qualities, giving in the operation but little friction.

This mineral has been found in many places but has not been worked successfully heretofore.

The deposit at Unionville, Chester Co., Pa., was abandoned for want of mineral of marketable purity. The veins at Chester are worked for emery, and cannot be classed as corundm. The belt of this mineral is more than 250 miles long, but there are only a few places in the whole of this distance that will warrant working. The mine at Corundum Hill, opened by Col. Jenks and others, has lately been sold to the Hampden Emery Company, of Chester, Mass., who are making extensive preparations for extensive work in the spring. This mine displays some very interesting features ; in one part the mineral is enclosed in chlorite, ripidolite, amaragdite, and in another portion the crystals have a gangue of albite. Col. Jenks took out crystals of considerable value, one of which sold in Ansterdam for $7,000 ; and it will not be surprising to hear of more being found of equal value.

Swiss Industries.

IT is not generally knows that most of the wondrous mechanism of complex watches—repeaters, chronographs, perpetual calendars, and the like—is planned and perfected exclusively in the remote valley of the Jura. The movements, technically known as *ebauches*, are taken to Geneva and elsewhere, cased, dialed, regulated, and finished, and then sent out as a peculiar Genevese production, the fact being that the Val de Joux possesses a practical monopoly of these marvels of horologic art; for there only are to be found workmen ingenious to contrive and deft enough to execute them.

Immense quantities of clocks and briar-root pipes are made at Morez and in the neighborhoon, and it is besides the headquarters of the spectacle and eye glass trade. The people, as people everywhere do, complain bitterly of the badness of the times, although they admit that the Exhibition has done them some little good.

St. Claude is a town of some importance, the *chef-lieu* of an *arrondissement*, and possessed of 7,000 and odd inhabitants. From an industrial point of view, it and the country round about are, perhaps, the most interesting parts of the Jura, for there are made nearly all the false stones and paste diamonds—certainly quite all the finer ones—that are sold, set and unset, in the Palais Royal, in Birmingham, in London, in New York, and, indeed, in every part of the world where there is a trade in cheap jewelry and imitation gems. Being anxious to know how this singular business was progressing—whether it shared in the general commercial depression, or was in the enjoyment of an exceptional prosperity—I waited on a dealer in false stones. "The false stone trade is in a most depressed condition, the workmen are not half employed, and the employment they had was owing rather to the good will of merchants and patrons than to any real demand. In the commoner sorts of false stones the Germans were running them very hard, but in the finer qualities, especially in diamonds, the manufacturers and lapidaries of Septmoncel and Lamoura (mountain villages near St. Claude) distanced all competitors; in fact, high-class goods could be made nowhere else. As proof of the badness of the times, and the depreciation that has occurred in these wares, some small paste diamonds that in 1872 were selling at 2 francs the dozen do not bring one-half the former price. These stones are all hand cut, and have 13 facets on each side. Some sorts of amethysts are worth, wholesale, 80 cents the gross, others 2 francs. It is difficult to see how false stones can become any cheaper than they are at present. But the making of artificial gems is not the only industry of St. Claude. A large trade is done in real diamonds, and many manufacturing lapidaries confine themselves exclusively to the polishing of *pierres fines*. Not a few of them are reported to have made large fortunes. The houses and mills (turned by water power) of these manufacturers are scattered about the hill-sides and the deep valleys of the *arrondissement* of St. Claude. Some parts of the work are done by the workmen at their own homes, and when business is brisk the wages paid to the *tailleurs* (cutters) of Septmoncel alone amount to something like $12.50 a week. Cutters of fine stones were once able to earn their 10 francs a day; ordinary craftsmen, working on false stones, 5 francs; but now work is so scarce that the average amount earned has fallen to less than half.—*London Times.*

Trade Gossip.

Edmond Tyler has made an assignment to Mr. Smith.

Charms decorated with Japanese designs are now attached to brooches and bangles.

Australia is to have a World's Fair, to be held in Melbourne, commencing October, 1880.

Venders of spectacles and cheap jewelry are preparing for their annual invasion of the South.

South America and Mexico are deluged with German cheap jewelry, consigned to commission houses.

One of Messrs. Tiffany & Co. large plate glass show windows was broken during the recent storm.

A fire recently occurred in the workshop of Hessels & Ludeke, 23 John street. Damage estimated at $1,000.

Savage, Lyman & Co., of Montreal, offer their creditors 35 cents on the dollar. Much sympathy is felt for them.

J. G. Josephs & Co., of Toronto, are reported to have failed. Their liabilities are in the neighborhood of $200,000.

Kirchmayer & Gruebel, manufacturing jewelers of Baltimore, have dissolved. Chas. Kirchmayer continues the business.

Mr. Charles L. Tiffany, senior member of the house of Tiffany & Co., has been decorated with the Grand Cross of the Legion of Honor.

Several Maiden Lane jewelry establishments have received professional calls from the light fingered gentlemen who infest the lower part of the city.

Motto scarf pins for gentlemen are the newest. These are inscribed, like street signs, "Keep off the grass," "Look out for the cars when the bell rings," &c.

The manufacture of jewelry from the pure blood of the ox is flourishing in Germany. What a lot of bloody airs the calves who wear big scarf pins and soup plate lockets will now put on.

Procrastination, we don't know his other name, entered Thrall's jewelry store, 12 Maiden Lane, and in an unguarded moment succeeded in purloining a gold watch of considerable value.

A notorious thief, said to be implicated in the Max Freund & Co. trunk robbery at Chicago, has been arrested by one of Pinkerton's detectives through the agency of the Jewelers' Protective Union.

The American pedometer is a grand success. A Melbourne jeweler has ordered 1,000 for the Australian market. Enterprising jewelers regard them as exceedingly attractive novelties for the holiday season.

Garnet, sapphire and jet jewelry is exceedingly fashionable and will be extensively worn this season. Messrs. Fowler Bros. & Co., who make a specialty of jet work, are producing admirable affects in this line of goods.

Among the Chicago bankrupts is the name of an individual, who is put down as a "capitalist; liabilities, $1,425,000; assets practically nothing." It takes a vast number of such "capitalists" as that to make a community wealthy.

A writ of attachment has been issued against H. Park, a jeweler in Wingham, Ont. Park sold out to E. T. Black in August last, at which time there were several judgments against him. The creditors propose to set aside the sale.

The large plate window of Johnson's jewelry store, corner Eighth avenue and Fifty-fifth street, was smashed by thieves on the afternoon of the 7th inst., and a quantity of watches and jewelry stolen therefrom. The thieves succeeded in making their escape.

The divine wrath of Dido, snubbed by the pious Æneas, wasn't a circumstance to that of a jeweler's wife in Brooklyn, the other day, when she got a note from her husband stating that having drawn a $2,500 lottery prize, he had concluded to start for Europe.

Mr. Chas. S. Higgins, of this city, while on a Wagner sleeping car, had stolen from his pocket an R. & G. Beesley watch made in Liverpool, number 26,537; hunting case, with monogram C. S. H. The trade will please be on the lookout for it and telegraph this office.

Ear-rings representing toads, beetles, frogs, and snakes, will be much worn this winter. As stuffed birds and imitation insects and reptiles play so important a part in completing a lady's toilet, the consequent inference is that a lover of natural history must be the inventor of these ornaments for the fair sex.

Messrs. Matson & Co.'s auction sale at Chicago has in a great measure demoralized the jewelry besiness in that city. This firm is one of the few who after the great fire paid one hundred cents on the dollar, and have evidently been driven to their present course by having so many bankrupt stocks thrown at them.

Judge Shipman, of the United States Circuit Court, has rendered a decision in the suit of Keyser & Co. against ex-Collector Arthur to recover an alleged excess of duties on jewelry, in favor of the importers, on the ground that the first liquidation is final as to rate, and that a protest and appeal within the statutory period was valid.

A large seizure of precious stones was recently made at the Chicago Post Office. The package was in transit from the Island of Ceylon to a person in Keokuk, Iowa. There were 923 stones in the package, including all varieties save diamonds. A letter in the package contained the information that another parcel was on its way.

Haviland & Co., of New York city, American representatives of great manufactory of Limoges faience, of the same name, recently received a cable dispatch from Paris, announcing that they had received a gold medal for the excellence of their exhibit, and that one of the firm has been decorated with the Cross of the Legion of Honor.

John Hattigan, of this city, was recently arraigned at the bar of General Sessions on two indictments, charging him with swindling the Waterbury Clock Company out of thirteen clocks, by means of forged orders, purporting to be signed by "J. M. Shaw & Co." He pleaded guilty, and will make up two years and six months of his lost time in the Penitentiary.

A valuable deposit of onyx has been found in Sonoma County, and it is the more valuable because it is small. Some specimens exhibited in San Francisco are pronounced superior to anything of the same kind yet discovered on this coast. The striations and shadings are remarkable for their variety and beauty, and make the onyx very suitable for ornamental purposes.

The New York Jewelers' Association have appointed Mr. Thomas Slater, of Enos Richardson & Co.; Mr. David Dodd, of Chatterton & Dodd; Mr. George C. White, Jr., of Rogers & Bro., and Mr. Thomas G. Brown delegates to attend the National Commercial Convention, summoned by the United States Board of Trade, to be held in the Masonic Temple, in this city, on the second Wednesday in November.

At a meeting of the Jewelers' League, held on the 1st of November, 1878, sixteen new members were elected, four applications laid over until next meeting, and several postponed until the requisite references are given. More than forty members of the League have signed the petition for an extension of the age limit to 48 years, and thirteen jewelers in the vicinity of Maiden Lane have signed a supplementary paper agreeing to join if the limit should be sustained.

Leroy W. Fairchild, manufacturer of gold pens and pencil cases, has received the official announcement of the award of a gold medal at the Paris Exposition, the only one given in this department. When we remember that these goods were in competition with those of the best known foreign makers, we may well be proud of the national achievement which reflects world-wide credit upon the enterprise and skill of the recipient of so distinguished an honor as the highest award in the gift of the Commissioners. This is the twelfth medal won by Mr. Leroy W. Fairchild at various world's fairs, as may be seen by reference to his announcement elsewhere.

The religious newspapers, not content with deluging the country with chromo watches, are advertising "diamonds in solid gold, one dollar each." Now that diamonds can be afforded at this low figure, every church member ought to have a few. The minister can wear them for coat buttons, and the Sunday school children can be made resplendent with them. On anniversary days, presentations can be made of dollar diamonds to the children who have gained the approbation of their teachers by reciting great numbers of Scripture verses. To be without diamonds when these gems are to be had at a dollar apiece, and the endorsement of the religious press thrown in, is little short of criminal neglect of opportunity.

Peter A. Frasse and Charles F. Frasse brought an action against James M. Montgomery to enjoin him from using their name and business reputation and trade mark. Plaintiffs are in the file and tool importing business at 95 Fulton street, New York—the business having been in the family over fifty years. Defendant was first a clerk and then a partner. In 1876 he left and started a similar business at No 105, putting up the sign which is now objected to, which reads: "James M. Montgomery, of the late firm of P. A. Frasse & Co." The words "P. A. Frasse & Co." were the most prominent, and it was claimed that old customers of that firm were misled. An injunction has been granted directing the name of P. A. Frasse & Co. to be taken off the sign unless the words "of the late firm of" be increased in size.

Legal Regulations for the Standard of Gold and Silver Ware in the Different Countries of the World.

BY EDWIN W. STREETER.

THE great variety of stamps to which, in the course of time, the French precious metals had been subjected, caused much perplexity to the officers of assize. To meet this complication an ingenious means of information was found, viz: *to provide all precious metal ware with a new stamp, the recense.* This was to be a stamp of verification for all the works of gold and silver then existing, and, as a rule, to be free of cost.

In 1836 the stamp or punch of the standard, and that of the Test or Assay Office, was to consist of one single stamp, which should bear a particular sign for each office (in 1838).

At the same time the *poincon de remarque* was instituted—a stamp to be placed at every four inches on chains, or precious metal ware of that character. They are now marked every decimetre

It is very certain that these strict laws have failed in the object they had in view, viz., the suppression of deceit, as was lately acknowledged in the assembly; nor has the precious metal been improved by them.

In the interior of France one scarcely knows how sensibly the interests of the industries and the public are injured by the above restrictions, because the French public have never enjoyed the advantage of buying cheap precious metal ware, and the French manufacturers have never experienced how much the demand for their manufactures would increase if the law allowed them to manufacture at a low standard and price, and trust to the increase of trade for their profits. In foreign lands this is otherwise.

The French gold-workers see what a tremendous part the German and Geneva manufacturers play in the world; they must daily remark how their wares are the source of great gain to strangers, while they themselves cannot partake of it. It is true French metal wares are brought from abroad, but only in very small numbers, and often solely for the purpose of serving as *models.* The Paris commissioner selects the newest and most elegant article, buys a small number, and sends them either to Germany or Switzerland, where they are imitated by the hundred in a lower degree of standard. If the French manufacturer tries to bring his own ware to the world's market, he has to battle with the creation of his own taste and his own genius without ever being victorious, because the laws of his own land forbid the manufacture of cheap ware.

The French industry will not always be content with this. *La Francc reclame vigoureusement la liberte du titre pour faire une guerre industrielle a Allemagne*, wrote a much respected Geneva gold-worker in March, 1873. Indeed, M. Tirard brought forward in the National Assembly a proposal to allow the gold-workers of France to work definite gold and silver ware for export according to what standard they pleased. The manufacturer, however was to be compelled to stamp his name and the degree of standard on each of his finished works. For non-compliance with this requisition he was to be subject to a money fine, and to have his goods confiscated.

The debate which ensued on the introduction of this motion gave us an interesting insight into the condition of the French gold-worker. It showed that the stamp duty which burdened this industry had been lately increased 50 per cent., the gain to the Treasury thereby being 6,000,000 francs.

The chief centres of precious metal ware industry are Paris, Besancon, Lyons and Marseilles.

Lyons pays yearly 100,000 francs stamp duty, and works principally for home consumption. At the same time it exports large quantities of goods which do not come under State control, such as are stitched or woven in with gold and silver. It is quite evident that in France the chief object of State control of the precious metal industries is not the protection of the public, but the enriching of their treasury.

Besancon pays from 800,000 to 1,000,000 francs stamp duty, generally upon watches, which shows us to what an extent this industry has grown here) Many more hands could be employed, if it were not that they are compelled, in consequence of the restrictions of the French laws, to send so large a number of their unfinished watches (most of them for re-exportation) to Geneva, where the gold may be of lower standard than is allowed in France.

M. Tirard, who brought forward this motion, called attention to the fact that no less than 140 articles, incorporating laws and restrictions for the precious metal ware industries, were still in force, and were no less unfavorable to them now than eighty years ago; and that, owing to these laws, the English, Swiss, Dutch and Germans exported French wares to the exclusion of the French themselves. Abroad there are but few French traders in the precious metal wares. The French nation are no traders ; and those who engage in trade deal not in French metal ware, but in German, and that to the amount of 30,000,000 francs annually. M. Tirard related that he himself tried in New York, and also in Mexico, to find French ware, hoping that where French troops had been French taste would have spread; but he everywhere came across German manufactures.

The eloquent defender of the forementioned motion, which would have been so advantageous to the precious metal industries of France, was unable to carry it. It was rejected.

Denmark.—We learn upon good authority (that of the Danish Finance Minister, through the Royal Mint and State Warden, Mr. S. Gross) that on the 7th of November, 1685, the king ordained that no silver should be worked of less standard than 13½ lothig (½ oz.), remedium ¼ loth.; and that all the ware should, according to law, be marked with the stamp of the manufacturer, and then taken to the warden, who, if he found correct, should stamp it with the Copenhagen arms (three towers) and his own initials.

Silver ware of higher standard was required to be marked with the higher standard stamp; and by a rescript of 15th of June, 1770, a fine of from 3 to 150 shillings was imposed in respect of such ware as, upon completion, should fail two, three, or four grains in its standard. A circular of 16th of June, 1792, made this still more stringent; silver-workers in the provinces being informed that, under pain of punishment, they were themselves to stamp the standard on each piece of their finished work.

As it happened in many other lands, the old laws had either lost their virtue or died out in Denmark. Gold ware, according to royal decision of 7th November, 1685, was to be of either 23 or 21 carats, and to be stamped with the letter *D* (ducat gold), or *C* (crown gold).

A royal rescript of 26th August, 1778, authorized the working of gold ware of 20 and 18 carats; and one of February 7, 1781, exempted small gold ware from stamping, and made the degree of standard for all gold ware optional, provided the goldsmith stamped each article with his name and the number of carats, for the accuracy of which he was answerable.

Precious metal ingots were to be stamped with either the standard or the city arms, and the initials of the warden.

In Turkey there is no law by which the standard of gold ware is regulated.

Most of the gold ware here is of 22 carat.

Previous to the year 1844, silver ware was required to have a minimum standard of $\frac{800}{1000}$; and since that time of $\frac{900}{1000}$.

Silver ware is stamped in the royal mint with the city stamp.

Greece.—No law is in force to regulate the standard of precious metal ware. The manufacturer, however, according to a police regulation, must deposit his name and stamp, engraven in copper, at the mayoralty, and enter the bought or sold precious metal ware in the police book of reference.

Belgium.—After the precious metal industry had been for a short time free from all legal encroachments of the State, through the effects of the battle near Fleury it came under the power and regulations of the French Republic, and so became subject to the strict law of the 16th Brumaire. This was somewhat altered for the better by a decree of 14th September, 1814.

The cost of testing siver ware of the first standard which is over 120 grammes, was one rappe for 39 grammes; and for spoons, forks, etc., of the same standard, and weighing less than 120 grammes, 5 rappes. Imported silver ware from Germany possessed a standard of $\frac{812}{1000}$; that from France $\frac{800}{1000}$.

Foreign Notes.

The death is announced at Ferney of M. Claude David, the proprietor of Voltaire's house and the first lapidary in Europe.

Watch glasses are manufactured at Trois-Foutaines, France, to the yearly amount of a million of francs, nearly three-fourths of this sum being for labor.

The dominant idea in English industry is Cleopatra's Needle. It has been made to do duty in ear-rings, brooches, paper weights, inkstands, candle-sticks, and the latest happy thought is to present an electro-plated pepper box, so arranged that the spice is shaken out by the hieroglyphics.

A drill which bores square holes is among the novelties of the Paris Exhibition. The tool is the usual form of a three-square drill, clamped or chucked in its holder, "so that it will wabble," which appears to comprise the whole secret.

Ivorine minerale, is the name applied by M. Roger, of Paris, to a lately invented substitute for horn and ivory. It can be made to take various colors, and especially dark hues. By pressing the warm mass into forms, various useful articles such as umbrella and cane handles, door-knobs, ink and pen-holders, buttons, etc., are produced.

The oldest pieces of wrought iron which are known are, probably, the sickles which were found by Belzoni under the pedestal of the sphinx in Carnac, near Thebes; the blades which Wyse found imbedded in the wall of the great pyramid; and the piece of a saw which Layarn dug up at Nimrod. They are nowowned by the British Museum.

The report has been published of the Select Committee of the House of Commons on the operation of the act relating to gold and silver Hall-marking. They have agreed to report the evidenee, and recommend their reappointment next session. They have also agreed to report the Watch Case (Hall-marking) Bill without amendment.

On the site of the lacustrine village near Estavayer, laid bare by the lowering of the waters of the Lake of Neuchatel, have been found amber ornaments belonging to the age of stone, and a beautiful golden buckle of the age of bronze. Four canoes are visible, but they have not as yet been raised to the surface.

The practice of buying cheap ornaments originated with the French, who wear pretty jewelry, though it is not made of 18 carat gold, chosing it as they do their well-cut, inexpensive dresses, wearing both while they are fashionable, and when no longer so throwing them aside. Consequently French women are always tastefully and fashionably attired.

Professor Palmieri, of Naples, has recently constructed an apparatus which allows the purity of oils to be judged of by the resistance that they offer to the passage of electricity. Olive oil—a poorer conductor than any other—is taken as the standard of comparison. The apparatus may also serve to reveal the presence of cotton in silk fabrics; for a very small proportion of cotton in silk tissues greatly increases the conductivity of the latter.

M. Toyama describes a simple way of seeing stereoscopic pictures without the use of lenses and without any straining of the eyes. The two pictures to be mounted with an interval between them of about an inch and a half. Then by means of a partition between the pictures and the eye, on the ordinary skeleton stereoscope the two parts are so separated that the right eye shall see only the right picture and the left eye the left picture. When this is done the two pictures will combine just as easily as with an ordinary stereoscope.

We learn from the Paris papers that in addition to the grand diploma of honor Switzerland has been awarded nine gold medals, thirty-three silver medals, forty-two bronze medals, and thirty-three honorable mentions in the Department of Horological Industries. The following distinguished makers have been awarded gold medals, viz: L. Audemars, Geneva; Badollett & Co., and Borel & Courvoisier, Neuchatel; H. R. Ekegren, Geneva; E. Francillon, St. Imier; H. Grandjean & Co., Locle; James Nardin, Locle; Patek Philippe & Co., Geneva, and Prof. Hipp, Neuchatel.

The electric light has been successfully applied to the bicycle by an enthusiastic Englishman. The motor is the hind wheel of the bicycle, and the apparatus is a small ordinary magneto-electric machine with rotary magnet, aided by a small pocket battery. The carbons are regulated by a train of wheels, worked by the trout wheel of the bicycle, the consumption being about one inch per hour. The apparatus takes up the room of a small valise, and costs in all about $25. The light is steady and equal to 120 candles, its great advantage being that it lights up the road thoroughly for 200 yards ahead on a dark night. Carriage makers and owners may find a useful hint here.

The gold medal awarded to M. Ern. Francillon, of St. Imier, for Longines watches, is said to be the highest ever given for low price watches made by machinery,

The faience of Palissy is characterized by a *sui generis* style, and by several qualities peculiar to itself. There is no flat painting in it, with shaded colors; its decorations consists always of reliefs colored. The enamel is hard and very brilliant, but little cracks may often be observed upon its surface. The colors employed are pure yellow, yellow ochre, a fine indigo blue, a greyish blue, brown, violet and yellowish white; for Palissy never succeeded in discovering the first object of his researches, the pure white of the Italian majolica; or, at least, he never was able to employ it in his work. The shells with which he ornamented his rustic pieces are the fossil shells of the Paris basin; the fish are those of the Seine; the reptiles and plants of the environs of Paris; nor is there any foreign productions to be met among them.

The model car sent to the Paris Exposition by the Pullman Company is 30 inches long, 8 inches wide, and is constructed entirely of gold and oxidised silver. It is furnished perfectly to the most minute detail. The rails upon which it stands are silver, and the wheels gold. The platform at either end is gold, chased with crossed lines, to represent the uneven surface of the common platform. The body of the car is of oxidised silver, exquisitely chased, and the doors of the same, while the knobs and hinges are of gold. Windows of plate glass, shaded by silk curtains, alternate with mirrors in rich frames. The revolving easy-chairs and footstools are of silver covered with silk velvet, and even the inevitable spittoon, no larger than a porcelain button, is perfectly made in silver. On the floor lies a handsome velvet carpet, and at each door the accustomed mat. The ceiling is tastefully frescoed, and tiny but perfect lamps of crystal are suspended therefrom, while the ventilators around the top of the car are minute doors of gold. Looking in at one of the windows, you see, locked securely in its closet, the stove in silver, which supplies warmth, and in another window you see that the dressing-room, with all its appointments, is not forgotten. The cost of the toy was $12,000, and its weight is 108 pounds.

In Paris more jewels are worn this year than ever before. After having imitated all the old designs found in Pompeii, new designs are now taken from Scandinavian tombs. Engagement rings are made after models found in the Isle of Bornholm. They are in the form of a twisted cord, and are not soldered together. The two ends lap over each other, and the ring can thus be made larger if necessary. The Alexandra cross is also in general favor. This is an exact copy of a cross found in Denmark, and the first one was worn by the Princess of Wales. Its shape is very peculiar; on each point is an enameled figure in red, green and blue. "Barbarian" styles have thus far been considered the most elegant in jewelry. For day wear silver mountings replace gold. The newest porte-bonheur is composed of three circles, linked together by fine chains. One of the circles is adorned with pearls, another with torquoises, and the third with diamonds. Gentlemen's rings are chased in Byzantine style, and have colored stones. They are mounted in dead gold. A ruby, with two sapphires, and emeralds with rubies are good combinations.

Imitation jewelry, or, as it is technically termed in Birmingham—its chief seat—the gilt toy trade has not suffered by the general depression to the same extent as the genuine or gold jewelry trade. Nevertheless, it is now in a very quiet condition and without any prospect of early improvement. Since the extended application of machinery to the manufacture of cheap personal ornaments, French imitation jewelry has been almost driven out of the English market, but it is admitted that in taste, neatness and finish of workmanship the French workers are still ahead of those of Birmingham, and that where price is not so much an object as style and quality the French goods take precedence. Still, many of the first-class patterns turned out by Birmingham makers, more especially brooch and ear-ring suites, are wonderfully fine for the money, being imitations of the choicest designs in gold, so exact in many cases as to deceive any but a practised eye. And it is to be noted that in goods of this class the purchaser receives much better value for his money than in nominally gold jewelry, which, on tne 9-carat standard, is about three parts copper, and often inferior in thickness of gilding to the so-called "gilt toys." It is remarked that fringed ornaments are in diminishing request just now, and that oxidized goods and imitation filigree, which is over-matched in the competition with the cheap genuine article, have almost gone out. People who effect these styles are commonly in a position to purchase the genuine article, and the more ordinary customers for gilt trinkets prefer solid-looking richly gilt ornaments inclining to a coppery lustre for Germany, and of a somewhat paler color, with chasing, for the English market.

Workshop Notes.

To Soften Steel without Injury to the Polish.—Boil the article for ten or fifteen minutes in linseed or sweet oil, taking care to have it covered with oil while boiling. Large articles take longer than the above.

Common brass clocks may be cleaned by immersing in boiling water. Rough as this treatment appears, it works well whenever they stop from dust or thickening of oil upon the pivots. Boil in rain water, and dry on a warm stove.

Patent Base for Artificial Gems.—The base of these gems are patented by the superintendent of the Royal Porcelain Works at Berlin, is a fluid obtained by melting together 6 drachms carbonate of soda, 2 drachms burnt borax, 1 drachm saltpetre, 3 drachms minimum, and 1½ ozs. purate white sand.

Boettger's Artificial Emeralds.—They are made in the same manner as his rubies, by employing nitrate of nickel instead of the chromate of potassa. The same plan, substituting oxide of chromium for the chromate of potassa, will produce gems of considerable hardness and beauty, though slightly opaque, which may, however, be lessened by the addition of a very little silica.

Soldering Fluid.—The ordinary "soldering fluid" or "acid" used by tinsmiths and others answers a very good purpose in preparing small articles to be electro-gilded or plated. In spite of the best efforts of the amateur, the work will sometimes strip or peel off. But if the article, after having been cleaned, is washed over, or dipped into this "acid," the coating applied will be found to stick as effectually as it does in soft soldering.

To Make Holes in Glass.—Spread on thinly some borax, after warming the glass. Remove the wax where you wish the hole to be made; with a piece of iron wire put on the spot a drop or two of flouric acid, and it will eat through the glass. Should it not be sufficient, make a second or third application of the acid. After the acid has eaten quite through, it may be enlarged or shaped with a file dipped in the oil of turpentine while using. To polish, use copper wire with rotten stone and oil. Another Mode.—Use dilute (1–5) sulphuric acid, with the ordinary drill; also to enlarge the hole, use it upon the file from time to time while using. After using, wash the files well, and dry quickly.

Boetter's Artificial Rubies.—Mosten recently precipitated and well-washed hydrate of alumina with a few drops of neutral chromate of potassa, and kneaded so that the mass assumes a scarcely perceptible tinge; then roll it out into small sticks, about the thickness of a finger, and dry them slowly, filling up any crack that may occur in drying with fresh hydrate of alumina. When perfectly dry, warm a stick a little, and bring a portion into the end of the flame of a compound (oxyhydrogen) blow-pipe. In a few minutes several minute balls forms, of such intense hardness as to scratch quartz, glass and granite. These, however, when cut and polished, appear slightly opaque.

How to Make Solid Rings.—The county watchmaker, who has neither rolls nor draw bench for making plain rings, can do very well by using a swedge made of any suitable piece of steel or iron, with a half-round groove filed across the face of it. The swedge should be held firmly in a stout vice, and may have a number of grooves corresponding to different shaped rings. The gold should be got out to the right thickness, and a little narrower than the ring is to be, and hammered evenly into the groove until it is the proper shape. It is much better to make a single ring in this way than to form it with square edges and then turn it up in the lathe, or to round the corners with a hammer. Even as many as a dozen rings can be made in this way at a time to very good advantage.

Watch Bezels.—It is often found necessary to alter the groove in the glass bezel of a watch. It may be injured or bent so badly as to require truing, or it may be found convenient to enlarge the groove to fit a glass. In either of these instances it is a work of no little time to turn and fit it to a wood chuck, which has been the ordinary way. A much simpler, and quite as correct a process, is to fit a brass face plate to the live spindle of a lathe, of a sufficient diameter to take on a large bezel. The chuck must be turned perfectly true on its face, and may have holes cut through the plate to receive the hinge or any other projection on the under side of the bezel. In working with this chuck it is only necessary to shellac the bezel to it, and guide it to truth by a slip of wood applied either in the groove or to the outside of the bezel.

When arbors become bent in hardening, they can be easily and effectively straightened by placing them on a piece of soft iron, and striking them on the *hollow side* with the pin of the hammer. Arbors should be tempered in oil, and not by bluing, as is sometimes done. A more regular and uniform temper is obtained by smearing them with oil and burning it off.

I send you the following method for putting in a hair-spring, which I think is as good a way as any I have seen given: I select a hair-spring of proper size, fasten it on the upper pivot of the balance with a small piece of beeswax, then, with my tweezers, taking hold of the coil that lies between the regulator, I vibrate the balance, resting the lower pivot upon the glass top of the movement box, in which there is a movement running. I select a movement, the balance of which vibrates the same number of times as the one I am at work on. You see the result. The going balance is directly under the glass, and the balance you hold is directly over, and the least variation can be detected instantly. Move the tweezers until the variations are alike. The right place for the regulator pins is a little in front of the point where you grasp the hair-spring. Since using the above method I have never had to pin a hair-spring a second time.

Short Clock Cases.—A great number of "Yankee clocks" have such very short cases that the pendulum rods cannot be over three or four inches long. These clocks, in many instances, will not run regularly, and sometimes will stop without any apparent cause. The cause will be found in the pendulum spring, which is almost always too thick and stubborn, and must be reduced by rolling, or, where that is not practicable, by filing and scraping. The springs, as a general thing, are left thicker than they ought to be, in order to avoid twisting and breaking by careless handling. A clock that would stop every day or two was treated in the above manner, with the following good results: The pendulum rod was 3¾ inches long. The spring was reduced by rolling to one-half its former thickness, and replaced in the clock, with exactly its former length. The clock then "moved off" as though it had received new life, and continues to go, showing no signs of its ever stopping till worn out. Although the pendulum was the same length as before, the clock lost 30 minutes a day on its previous rate.

In making small articles of steel, one often has to devote more time and labor to finishing and polishing a piece of work after hardening, than was originally expended in its manufacture. The following is a good method for hardening steel without *scaling* or injury to finish. *First*, dissolve common salt in soft water until there is an excess of salt at the bottom of the vessel; take a quantity of buckwheat or coarse flour and some of the salt solution sufficient to make a thick paste, which should be thick enough to retain its form and shape when in use; cover the article to be hardened with the paste, pressing it together firmly so that it shall adhere to every part of the surface, a small article will require a coating at least as thick as its diameter; a large piece requires a thicker coating, and should be of sufficient quantity to prevent the surface of the steel being exposed during the process. Heat carefully at first until the water is all evaporated; then bring the mass to a bright red heat, and plunge it into the salt bath until nearly cold. After washing the surface will appear of a dirty white, or, if not very hard, of a light gray, as if stoned off for polishing, then polish and temper as usual.

Gold Filings.—The following process is very useful for working up filings and scraps of gold, gold-plated jewelry, etc. It does not, of course, refine the gold, as in the usual process of quartation. It merely destroys the filings of copper, silver, German silver, brass, and other metals acted upon by the acid. It will "eat" the solder or brass out of hard soldered and plated goods, leaving the thin shell of gold. The iron filings are thoroughly separated from the mass by the repeated use of the magnet. All pieces of soft solder and lead should be picked out, and if there is much soft solder in any of the plated articles it should be melted out, and the residue then placed in a shallow glass or china vessel and rather more than covered with good nitric acid. When the bubbles cease to agitate it, the acid should be poured into another cup, and if there is any base metal left, more acid should be added, and the mass stirred occasionally with a strip of glass. When no bubbles appear on adding new acid, that may also be poured off, and the filings washed two or three times, or until perfectly clean, letting them stand a minute or two to settle before pouring off the water. They are then dried and melted. The filings and scraps treated in this manner seldom require more than one melting to make them easily worked and fit for jobbing. There is no skill required, only considerable care in the handling. The silver remaining in the acid may be precipitated in the ordinary manner with common salt. The chloride obtained is fit for the repairer's planting solution, or may be melted into a button, and, being pure silver, used as an alloy for other gold.

Business Notes.

Morgan & Headly, of Philadelphia, so long famous for their gold and silver spectacles and eye glasses, have recently added glasses framed in steel to their line of goods. These are light, strong and serviceable, while the glasses themselves are of the same quality as those which are more expensively mounted.

Messrs. J. T. Scott & Co., the well known jobbers of this city, have recently become the eastern agents of the Rockford Watch Company, a full line of whose movements they keep constantly on hand. The Rockford Company is to be congratulated on having secured the services of such an enterprising and energetic firm to manage their eastern business.

Colby & Johnson, of this city, importers of watches, jewelry, etc., present in this number illustrations of their celluloid watch cases, the latest novelties made from this seemingly inexhaustible material. The attractive features and desirability of these goods is intelligently set forth in their advertisement, and, we have no doubt, will be read with considerable interest by the trade.

Simons Bros. & Co., of Philadelphia, whose goods achieved such a high reputation at the Centennial, are noted for their manufacture of gold chains, jewelry, thimbles, gold-headed canes, etc., of which they have an endless assortment in great variety of artistic designs. Their goods have a standard reputation throughout the trade, and for conscientious workmanship and beauty of finish are not to be excelled.

Ripley, Howland & Co., of Boston, having an office in this city, are manufacturers of rich fine jewelry. They have a patented method of setting stones which increases their brilliancy. The points which hold the stones in place are tipped with platinum, thus avoiding the obtrusion of yellow metal about the gem. The advantages of this setting will be readily appreciated by a reference to their advertisement.

Saxton, Smith & Co., manufacturers of gold chains, offer a large and attractive stock of goods, embracing all that is new and desirable in their line. This firm is favorably known throughout the trade not only for the standard quality of their goods, but for the excellence of their design and finish. They are also sole agents for the new patented chain bar, containing a detachable pencil, a novelty which is finding great favor with the public.

Messrs. Fowler Bros. & Co. present on another page of the CIRCULAR examples of garnet, jet and onyx goods, manufactured by them. It will be seen that the designs are original, novel and taking, suitable to the requirements of all classess of dealers. These goods can be had from the jobbing houses only, as their relations with them prevent their selling direct to dealers. Messrs. Fowler Bros. & Co. deserve great credit for their efforts to protect the interests of their constituents, and the means taken by them to bring to the notice of retailers and the public this class of goods will, doubtless, be appreciated by all who handle them. On account of the moderate price of this style of work, there has already grown up a great demand for it. Dealers desiring to purchase can order through any jobbing house with whom they deal.

Simpson, Hall, Miller & Co., of Wallingford, Conn., have issued, in sumptuous style, an illustrated catalogue of goods manufactured by them. The plates clearly represent the originality and novelty of their designs, among them are many which have not been surpassed for elegance and fine workmanship. The catalogue itself is a beautiful example of typographical art, doing credit alike to the printers and the enterprising firm in whose interests it is published. This catalogue is published exclusively for the trade, and will be found of great value to all dealers into whose hands it may fall. It would be invidious in us to eulogize a house so well and favorably known; the style and workmanship of their goods speak for them, and will commend themselves to all dealers.

Kossuth Marx & Co. have just patented a new and novel arrangement for measuring sizes for finger-rings. It consists of an elastic metal band, upon which the sizes of finger-rings, according to Allen's U. S. standard gauge, are distinctly and legibly marked. This can be slipped over the finger and the size of ring required accurately ascertained. It is a compact and convenient instrument, the use of which will prove a great saving of time to jewelry salesmen. The size being obtained, the measurer preserves the mark until such time as the hurried salesman may wish to refer to it. It is far preferrable to the old stick heretofore used for sizing rings. The same firm has also provided a bracelet size, or measure, on the same principle. These are now offered to the trade by the patentees. No. 39 Maiden Lane, New York.

We are requested to state that the American Pedometers can be obtained by the trade direct (only) from Messrs. Tiffany & Co., New York. They are not for sale by the jobbers.

Thomas G. Brown, the enterprising artist jeweler of this city, and one of the fathers of the trade, seems to increase in enterprise as he advances in years. Not content with the means achieved by his reproductions from the Castellani collections, he is now engaged upon a number of adaptations from antique models which promise to be the rage in first-class society during the coming season. The same high order of classic taste is evidenced in the numerous class and decorative medals which have been designed in his establishment.

C. G. Alford & Co., manufacturing jewelers, No. 183 Broadway, continue to forward to legitimate dealers their illustrated catalogue of designs. We take great pleasure in calling the attention of the trade to Mr. Alford's efforts in this direction, as he uses every precaution to keep his catalogue out of the hands of all outside the trade. Dealers applying for it must enclose their business card, for in no instance will the catalogue be sent to any person not actually in the trade. These designs can be shown by dealers to their customers to select from with perfect impunity, as they in no way betray the profit they may choose to exact in the transaction. We commend the course pursued by Messrs. Alford & Co., in this respect, to our Chicago friends, many of whom might follow their example with credit to themselves and protection to the trade.

We would direct the attention of our readers to the very attractive advertisement of Messrs. Aikin, Lambert & Co., which appears elsewhere in this issue. This enterprising firm are constantly introducing new designs and taking ideas in which utility is combined with elegance. For the coming season they offer superb efforts of inlaid work, in which floral and avial decorations in precious metal are set in celluloid, ivory, malachite, coral, jet and shell. The pencil cases thus decorated are quite new to the trade, and are already in great demand. The trade are already familiar with the attractive features of the Novelty Tray assortment which has already been described in the pages of the CIRCULAR, and the arrangement is considered to be the most effective in use for the display of goods, and we know no more effective display for the holiday season than a Novelty Tray well stored with a choice assortment of the goods of Aikin, Lambert & Co.

The stylographic pen is something new, which all persons who have much writing to do will hail with delight as soon as it is brought to their notice. It is a combination of the fountain pen and the stylus, is convenient to carry in the pocket, or equally serviceable as a desk pen. Once charged with ink it will write for a week without troubling the ink stand. It writes smoothly and easily upon any kind of paper, and there is no possibility of dropping ink and making bad blots on the paper. The pocket size is very convenient for general use, as it can be carried, fully charged with ink, in the pocket without any danger of the ink escaping. There is no split points to get out of order, but simply one point made of iridium, alloyed with platinum, which will last many years, while the other parts are made of vulcanized rubber, gold and silver. A large number of them are in use in the New York post office, and they are rapidly finding their way to the counting rooms of all our business men. Mr. C. W. Robinson, No. 169 Broadway, room 13, is the general agent for these pens, who will take pleasure in showing to all who desire to test them, or in answering correspondence relating to them.

Messrs. Cox & Sedgwick, the well known manufacturers of jewelry, have probably done more to cultivate and encourage a correct taste in onyx goods than any other house in the country. They originate their own designs, the more important of which are secured by letters patent, and which have made the name of the firm famous throughout the trade. Onyx jewelry has become a standard article of personal adornment, and is universally worn for mourning attire. We cannot speak too highly of their productions, nor of the inventive skill and ingenuity of the firm who so deftly fashion these stones into attractive and elegant jewelry. This firm is especially noted as manufacturers of the higher class of goods which may be found in the leading jewelry establishments of this country. As proof of the superior excellence of their designs, we would direct the attention of our readers to the illustrations of their onyx goods which appear on another page of the CIRCULAR. While these illustrations give an idea of the designs, they cannot indicate the richness of the material or show the superb workmanship lavished upon them. The mounting of these goods is a work of art in which this house excels. The number under each object corresponds with a number registered in their book of designs, so that dealers can order as intelligently as though they were here in person. Moreover, this plate will give to dealers, whose stock of onyx goods is limited, an opportunity to show their customers the latest novelties in this line, a point which the sagacious will not hesitate to avail themselves of.

THE

Jewelers' Circular and Horological Review.

VOLUME IX. NEW YORK, DECEMBER, 1878. No. 11.

THE

Jewelers' Circular & Horological Review.

THE RECOGNIZED ORGAN OF THE TRADE.

A Monthly Journal devoted to the interests of Watchmakers, Jewelers Silversmiths, Electro-plate Manufacturers, and those engaged in the kindred branches of art industry.

SUBSCRIPTION:

To all parts of the United States, Canada, Great Britain and the West Indies, **$2.00 Per Annum; Postage paid.**

To France, Switzerland, Germany, Mexico, the Republics of South America, and Australia, $2.50 Per Annum; Postage paid.

☞ *All communications should be addressed,* D. H. HOPKINSON, *No. 42 Nassau Street, New York.*

ADVERTISING RATES MADE KNOWN ON APPLICATION.

AGENCIES, { J. H. PURDY & Co., 170 State Street, Chicago. / PRATT & Co., Ninth and Arch Streets, Philadelphia. / HERMAN BUSH, 14 Mytongate, Hull, England. / FREARSON BROS., Adelaide, Australia. / T. T. JONES & SON, 330 George Street, Sydney, Australia.

The Political Situation.

THE elections are over and people are settling down to business again. The political events have been somewhat unexpected, but everywhere the indications of returning prosperity are certain and frequent. Neither of the leading parties can reckon on an undisturbed lease of power, and we are freed from the dread of those abuses which invariably accompany firmly rooted dynasties. Statesmen know that they are on trial and will work more for the public good than if their terms were fixed, and both the "ins" and "outs" are bound to make a fight for reform and better management. The collapse of the greenback movement puts an end to all fear of repudiation and its attendant evils, and the equal balance of party brings the best men to the front, for the country will have none other, and relegates professional politicians to the ranks. As an example we may cite the defeat of Butler in Massachusetts, and of John Kelly in New York. Here were two notable men, the former of infinite ability, the latter recognized as having done good honest work, but both have been defeated, simply because the popular demand is for measures not men. The people require good conduct of affairs, and repudiate any approach to one man power. Despotism cannot exist in the States, and our citizens are jealous of the first approach to it. They want good administration and will have it. Hitherto vested political influence has blocked the way, but even as the English middle class grew in strength while king and barons struggled for supremacy, so will mercantile and commercial interests profit by the equalized contest between Republicans and Democrats. Heretofore they have been ignored or regarded as a prey for the dominant party. Our custom house has been a quicksand to commerce, and our financial policy has paralyzed mercantile efforts. Politicians have distinguished themselves by their ignorance of business principles and financial truths, and the real welfare of the country has been sacrificed to the private ends of a favored few, whose self-assertions rode rough-shod over everything and everybody. Now the people have had enough of them and their doings. Now is the opportunity of the business community to voice its wants and demand their remedy. The tariff and the bankruptcy laws must be re modelled and re-enacted. The latter will be done within a short time, and an attempt has already been made toward the former, although Mr. Wood's bill was so unequal and unsatisfactory that we have reason to be thankful for its defeat. In brief, the political situation stands thus: honest money is assured and repudiation is out of the question; a bad bankrupt law has been obliterated, and an improved enactment is a necessity; an attempt has been made to amend the tariff, and the road to reform having been opened up, progress to the desired end is certain at an early date. What wonder then is it that on all hands we feel renewed confidence and hear of indisputable revival of business.

Misdirected Genius.

MR. GRAHAM BELL and Mr. Thomas Fletcher, American inventors, who have done some of their work in England, have published letters complaining of the lack of capacity and ingenuity among British workmen. They state that the English mechanics run in grooves, and that it is impossible to get them to adopt new ideas or to change their methods. Even when these gentlemen furnished drawings for their work, the British mechanics could not or would not do it, and the inventors were obliged to do it themselves or send it to this country. No one will complain of a lack of ingenuity on the part of American workmen. We are a nation of inventors, who scorn the beaten track and daily routine as vigorously as the British workman clings to it. It is said that the American baby lies in its cradle cogitating improvements in its mechanism. The inventive skill of our people has done much to give us rank among the first commercial nations of the world. American machinery is everywhere noted for its simplicity and excellence of construction, for its great labor-saving qualities, and for its cheapness. All this is most excellent, and something of which we should be proud. Inventive genius is most desirable so long as it is confined to its legitimate channel—the production of that which is new and desirable. But, we regret to say, much of our Yankee talent for invention is misdirected, and, pursuing the by-ways of illegitimate traffic, becomes a positive curse to the country. This is displayed in its attempts to overreach honest industry. The person who designed our gold coin was an inventor deserving of commendation, but the inventor who designs a deceptive counterfeit of it is a person whose misdirected genius should be confined to the limits of a State Prison. We have too many tricksters among our inventors, who, finding a good idea patented by another, devote their time and talent to discovering ways and means for appropriating the idea to themselves and evading the patent. Instead of seeking to rival their competitors in the production of original ideas, their sole thought is how to steal the ideas of others without laying themselves liable to prosecution for infringement. Seeing a good thing which is protected by a patent, they exclaim at once, "I can imitate this, and, by a slight change in the mechanism, evade the operations of the patent, and thus reap the fruits of the inventor's genius and industry." This is misdirected genius—inventive qualities prostituted to base employment.

We see this point very decidedly in the jewelry trade. A designer, for instance, who puts both heart and conscience into his work, after weeks or even months of patient labor, produces a design in jewelry which is a work of art. To protect himself and the public, he patents his design. No sooner is this done than one of these geniuses whose energies are misdirected, seizes upon the idea, makes a few immaterial changes, and forthwith destroys the value of the work of art by reproducing it in debased metal. It thus occurs that the work of the honest inventor and the unworthy imitator jostle each other in the show cases of dealers, and are brought in competition over the same counter. The value of the work of art is thereby destroyed because the market is flooded with cheap imitations. Paste usurps the place of diamonds, oroide overrides pure gold, and celluloid invades every department of the trade. There is such a thing as having too much of a good thing even, and it is becoming a question whether the infliction upon us of too much ingenuity does not override its compensating advantages. The British workman is censured for traveling in the ruts worn by the feet of his great-grandfather, but it is a question if undeviating stolidity is not to be preferred to a prostituted ingenuity that is so "unanimous" as to invade every avenue of trade and commerce. That our patent laws, which utterly fail to protect inventors, is largely to blame for this condition of things is a fact that cannot be denied; but it is also true that manufacturers are themselves largely responsible for it. If they would depend more upon the amount of conscience put into fine goods and less upon the trickery required to sell cheap imitations, they would enhance their reputations greatly, and, in the end, increase their profits correspondingly. Let the genius now misdirected in the manufacture of cheap goods be devoted to the development of the best in the art, and it may yet be redeemed. But we greatly fear when this is brought about the millenium will have arrived.

Jobber vs. Retailer.

COMPLAINTS continue to pour in upon us regarding jobbers who are seeking a retail trade. The holiday season seems to have inspired some of the jobbers, especially some of the Western ones, to precipitate upon the country a perfect avalanche of circulars and price lists, addressed, not to dealers, but to individuals, soliciting their orders, and offering to sell by retail at wholesale prices. Hardware merchants and shoe dealers are urged to lay in a small stock for the holiday trade, and to enter into competition with the local dealers in jewelry. Tax records and city directories are consulted for the names of individuals to whom tempting circulars may be sent, and no effort is spared by these illegitimate jobbers to rob the retailers of the trade that by right belongs to them. The sample fiend is also "on the road," loaded down with cheap goods, which he hawks about in lobbies of hotels and the shops of butchers and bakers and candlestick makers. Whoever can be persuaded to buy is offered goods at prices far below what the local dealer can afford to sell them for, and, of course, his trade is injured by just so much as the sample fiend sells, while the suspicion is sown among his neighbors that he charges exorbitant prices for his goods.

As we have before pointed out, the remedy for this evil lies in the hands of the retailers. Let them organize and present their grievances to the manufacturers. As between the retailer and the jobber the manufacturer must stand by the retailer. He is the medium through whom the manufacturer reaches the public, and upon whom he must rely for the disposal of his products. If the retailers were to combine against these illegitimate jobbers the manufacturers would be compelled to impose such restrictions upon all jobbers as would effectually prevent their poaching upon the preserves of the retail dealers. Such a combination would not he difficult of organization, and, considering the varied interests at stake, it is a matter of astonishment that a Retail Dealers's Association has not been formed before this. But individuals must protect themselves against the illegitimate competition offered by hardware dealers and shoe-dealers. Let them, in military parlance, make reprisals. If outsiders carry a line of jewelry, let the jewelers stock up with goods which their competitors handle. A hardware man can be brought to a realizing sense of his misdeeds if the jeweler invades his province and carries a full line of cutlery and table ware, while a stock of button hooks and kindred knick-knacks will disgust the shoemaker. Diversified industry is a good thing for the country at large, but does not work well when brought down to individual practice—if the shoemaker does not stick to his last he must expect to have his field of labor invaded and his peculiar functions usurped by others.

An old retailer from the west disposed of a tailor who carried a line of gentlemen's jewelry—sleeve buttons, scarf pins, etc.—by persuading his friends to withdraw their patronage from him, and to tell the tailor that they did so at the instance of the jeweler. The tailor soon called around to see what the trouble was, and as a result of the interview, turned over to the jeweler his entire stock of sleeve buttons, pins, etc., affirming that henceforth he would live for breeches alone. This same retailer was the evil genius of the sample fiend. These fellows usually carry in their sample cases a few things which they call "leaders"—desirable goods which they sell cheap for the purpose of working off less salable stock. After going the rounds of the city and retailing all the goods possible, the sample fiend would hunt up the retailer and try to work off some old stock on him. He was always ready to buy, and went through the samples religiously and carefully. Then selecting all the "leaders," he invariably bought the whole lot to the great disgust of the sample fiend, who was thereby forced to go into dry dock for repairs—in other words, lay by until he could get a fresh supply of "leaders" from the home office. But the most efficient way for the retailers to protect themselves is to organize. If all those who have written complaining letters to us on this subject would band together they would constitute quite a formidable association.

Debased Gold Watch Cases.

WE have heretofore alluded to the practice, which prevails to a certain extent, of falsely stamping gold watch cases, whereby a fourteen karat case is made to pass as eighteen karats fine. This is a fraud upon the public and upon the manufacturers of fine goods, which there should be some law to reach and punish. Gold goods should have fixed standards of value, and the mark placed upon them should indicate that standard honestly under severe penalties. That fraudulent watch cases are put upon the market, however, is as much the fault of the dealers as of the manufacturers. Dealers who have gained some notoriety for enterprise, and who are not troubled with conscientious scruples, give orders to have a low grade of goods made and stamped as being of a higher grade. Manufacturers become *particeps criminis* in the perpetration of the fraud rather than lose the sale of the goods. This, of course, is not a valid excuse, but they argue that if they do not do it some one else will, and thus soothe a conscience not easily disturbed. Considerable work of this kind is done by Canadian houses, who not only have a fictitious value-stamp placed upon their goods, but the initials of well known manufacturers as well. As this is counterfeiting a trade mark, it is liable to be punished if it can be reached. But the public is the greatest victim, although the manufacturers of honest goods lose trade thereby. The purchasers of such fraudulently stamped cases are robbed just as effectually as though their pocket-books had been abstracted from their pockets. By fraudulent and dishonest representations they are made to pay for goods that do not possess the value attributed to them on their face. This swindle is a growing one, and has other phases than the mere stamping of the goods, the gold being, in some instances, merely a surface veneer instead of a solid case.

We do not see how the public is to be relieved from the possibility of such fraudulent practices until Congress enacts a law fixing the standard of gold, and providing that its various degrees of

fineness shall be legibly stamped upon all goods manufactured from it. What has been denominated the "Hall Mark" in England has been found to work benificently, and might, with modifications, be made serviceable here. The manufacture of fine jewelry is classed among the fine arts, and it should be protected by law from debasement by unscrupulous charlatans and fraudulent manufacturers. It is a simple thing to provide the means by which the genuine may be distinguished from the spurious, and all classes of goods thereby compelled to stand upon their actual merits, not deriving a fictitious value from fraudulent marks that may now be affixed with impunity by any one. It is simply necessary to recognize the different degrees of fineness commonly used in the manufacture of jewelry, to provide that these shall be properly designated upon the face of the goods, and to provide adequate penalties for the manufacture or sale of goods that are marked otherwise than at their intrinsic value. The art future of the trade depends upon something of this kind being done. Under the present condition of things the jewelry trade is rapidly becoming demoralized—if that condition has not already been reached—because of the possibilities for fraud which it presents. The efforts of those who seek to dignify and elevate it are neutralized by those unscrupulous persons who live but for the present dollar, who believe in getting the dollar, but are unscrupulous as to the means employed in its attainment. When we see our leading manufacturers crossing the ocean and carrying off the first honors in a competition with the gold workers of the old world, it is a matter of deep regret to know that there are others in our midst seeking to undermine and overthrow all that they have accomplished, and to degrade the jeweler's art by fraudulently debasing his goods. All that is necessary for the advancement of the art is present among us—we have the talent for designing, the skill to execute, and the capital to give effect to these; yet in the face of all these, it is a fact that, as considered as a body, the jewelers' guild is retrograding rather than advancing. What the few are doing in the right direction is more than counterbalanced by the men who resort to trickery and debased goods to secure their trade. All branches of the art are infected alike, the unscrupulous majority undoing the work of the honest minority. It is a necessity of the times that some legal remedy be applied to prevent the debasement of gold goods that is now going on. Laws are necessary as well for the protection of the swindled public as for the salvation and advancement of the art itself.

Fourth Annual Banquet.

THE fourth annual dinner of the New York Jewelers' Association took place at Delmonico's, Fifth Avenue and Twenty-sixth Street, on the 13th of November, 1878. Over a hundred members and guests were present. Among the latter we noticed Judge Brady, Hon. Jackson S. Schultz, Rev. Dr. Tiffany, Hon. Isaac H. Bailey, Gen. Horace Porter, Mr. E. T. Bartlett, Mr. David F. Conover, of Philadelphi, Mr. George H. Ford, of New Haven, Mr. David C. Dodd, Jr., of Newark, Mr. George P. Rowell, Mr. R. C. Black, Mr. T. S. Steele, of Hartford, Mr. Pipers, Mr. Lovecraft, Mr. Cottle, Mr. George Strong, of New Orleans, Mr. Charles L. Tiffany, Mr. G. F. Gleason, Mr. O. E. Zadek, of Mobile, Mr. Leding, of Washington. The attendance was much larger than on any previous occasion, showing the continued prosperity of the Society and its increasing influence in the trade and in the world at large.

The following was the bill of fare, showing the good things offered on this occasion by the famous caterer in charge of the affair:

MENU.

POTAGES.—Consomme, Rachel. Tortue verte.
HORS D'ŒUVRE.—Varie. Croquettes a la Victoria. Varie.
RELEVES.—Saumon a la Ventitienne. Selle de mouton a l'anglaise.
ENTREES.—Escalope de filet de bœuf, hongroise. Ris de veau a Poseille. Caliles a l'Americaine.
SORBET.—A la Romaine.
ROTIS.—Canvass-back. Perdreaux.
ENTREMETS.—Petis pois. Tomates sautees. Haricots panaches.
SUCRES.—Plum pudding a l'anglaise. Creme rubanee. Biscuits Tortoni. Petits fours. Charlotte Doria. Mousse macorons. Gateaux. Fruits and Desert.

After the substantials had been disposed of and the gentle influences of good wine had brought out the bright side of human nature, Mr. Daniel F. Appleton, President of the Association, requested the attention of the members, and spoke to the following effect.

ADDRESS OF MR. DANIEL F. APPLETON.

Members of the New York Jewelers' Association: We are met here to-night to celebrate the fourth anniversary of our society, and I commence by congratulating you upon its prosperous condition. During the year that has just closed, we have nearly doubled our membership and proportionately increased our influence. I regret to say that I cannot congratulate you upon a similar state of affairs in the condition of trade with you, as individuals, but I think I may say, safely—after consulting with the learned and experienced gentlemen on my right and on my left—that we have at last, in that respect, reached the worst, and that we may reasonably hope that from this time forward there will be a marked improvement in our trade.

It becomes my painful duty to refer to the loss which we have sustained since we were here on a similar occasion a year ago, and to ask you to join with me in paying our respects to the memory of one whom we all loved and respected for his great qualities of head and heart. We attended his funeral but lately, and most of us were there; but I wish it was in my power to repeat to you, for the benefit of those who were not present, the eulogy pronounced there upon the character of our departed friend, Mr. Jaques Guedin. It was the more striking, because it was pronounced by that austere and godly man, who, to use his own language, has himself been sitting on the edge of the grave for two years. I think you will agree with me when I say that the eulogy he pronounced upon our friend gave him as perfect a character as it was possible for even Dr. Tyng to conceive of. When I say it was perfect, I can go no farther. I ask you to fill your glasses, and rising in silence drink to the memory of our departed friend.

There are many things I might say to you in the nature of congratulations and felicitations among ourselves, but I feel that you will be anxious to hear the gentlemen who are here as our guests, and who are anxious also to become better acquainted with you, by addressing and speaking with you, and I can therefore, for their benefit only, before they begin their remarks to you, refer to some things particularly relating to yourselves, which may be interesting. I want to tell them that, notwithstanding the danger that, in this great city, with so many interests, and such large ones as compared with ours, our friends may be prompted to look upon us as an insignificant body—I want to tell them and make them feel that we are not only an integral part of the business of the city of New York, but constitute a not unimportant part of the manufacturing and commercial interests of the city. I will state a fact which appears from the statistics, and for the purpose of illustrating the point, will refer to only one branch of our trade—the manufacturing jewelers. There are between two and three hundred in the City of New York who take the metal—gold—put it into the crucible, and produce the finished article from it, and I can learn, after the most diligent inquiry, of only three who have, since the panic of 1873, become bankrupt. This is certainly a good showing, and indicates that manufacturing jewelers are, as a rule, careful, prudent, business men.

I have thus introduced you by this fact, not by name, but by your characters, to our guests. I shall proceed to introduce them to you; and before I do so, I want to ask you to pay your respects to a member of our own guild, a gentleman for whose character position and achievements we all have great respect, and for which we choose to honor him to-night; and while he is one of ourselves, he is still our guest. I am going to present to you a gentleman whom the government of France has been pleased to honor as a representative of American manufacturing jewelers. I introduce to you

MR. CHARLES L. TIFFANY.

Gentlemen: I am certainly very much obliged to you for the very cordial manner in which my name has been received, I wish it lay in my power to thank you in suitable terms, but you all know that I cannot. I am very happy to be one of your number, and I see now how much I have missed in not attending the annual dinners that you have given heretofore. This is my first one. Again, I am very much obliged to you, gentlemen. [Loud applause].

THE FIRST TOAST.

The President next proceeded to announce the first regular toast of the evening, "The City of New York; her Prosperity and her Honor are dear to us;" and in response to this toast, called upon the Hon. Isaac H. Bailey.

RESPONSE OF HON. ISAAC H. BAILEY

Gentlemen—I had presumed that I was on friendly relations with you, but the late hour at which I got my invitation to the dinner, somewhat discouraged me. [Laughter]—and I feel something as the man did in the theater in Philadelphia, when "Romeo and Juliet" was being played, and the man who was cast for the character of Romeo was taken sick, and another man took his place. When in the scene where Juliet passionately says, "Romeo, wherefore art thou, Romeo?" a man in the gallery sang out, "Because the other man is sick!" [Applause]. I called in to see my friend Mr. Ely, who was laboring under an invitation to this dinner, but he doubted whether he was in a physical condition to dine with the jewelers. I told him they were a kind of people that it took a large sized man to sit up with! The next day I got a note from Mr. Appleton, saying Mayor Ely was ill, and asking me to come in his place, Of course, I never hinted to Appleton that I had no idea of being left over in that way! It reminds me of the "fourteenth man" they keep in Paris, where dinners are frequently given, and in case of any emergency, when an expected guest fails to arrive, the fourteenth man is always ready, in full dress, and can step right in.

Mr. Jackson S. Schultz here remarked that he understood that Judge Brady, when he was in Paris, sought that position!

Mr. BAILEY—In reference to the toast, speaking of the City of New York, it is a difficult thing to speak about anyway, because, after having tried for five and twenty years, with the assistance of our friend, Schultz, we have just got our first glimmering of a possibility that the thing can be done. If I were a Dutchman, I would be inclined to say, "We have had too tam many Mayors, who didn't last long; very good fellows, but didn't seem to counect." New York has two sides, and it is my misfortune to associate a great deal more with the other side than this, and to see people, who, so far from wearing jewelry, regale themselves with the sight of the French paste in the Bowery windows. But I will say this for them, that judging by the processions of lager beer wagons filled with kegs, that roll down the Bowery from morning to night, they never cease to enjoy themselves after their fashion And I have made up my mind that there are two classes of enterprises

that will live in any sort of times, hard or good, and that is the business that addresses itself to the appetites of men, and that which addresses itself to their fancy. In regard to this appetite, it is an enormous thing. I do not like to dwell upon it here, because I might seem to be casting reflections upon this table, but I am informed that there is in this room to-night—though I shall not expose him—a respectable citizen of a neighboring city in Connecticut, who has migrated from New Haven, for the purpose of being with his fellow jewelers to-night, because New Haven has deprived her citizens of obtaining their favorite beverage! I dont know but that man would be tempted to Ford a stream—[applause]—to swim across the Harlem river—for the sake of partaking of the bounties of this occasion. Gentlemen can have some idea of the force of this appetite, and can see what it will do when it will drive a man from his home in Connecticut to come down and revel in the chambers of Delmonico. Now, your chairman has given to this table a clue to the wonderful success of the jewelry business; and by the way, I had an interview with a gentleman connected with the press, a few minutes before he came up-stairs, and he expressed surprise at seeing so many jewelers here, supposed the panic had broken them all down, etc.; but I finally found that he didn't belong here, but in the other room, with the Board of Trade. I think the jewelers are the most thrifty men in the world. They seem to have been so in all ages, and under all circumstances. They were, in the most remote ages of antiquity, the men who supplied money to the world. Notwithstanding the miseries and misfortunes of their fellow-business men, they always seem to prosper. But I have, I think, ascertained a part of the secret to-night, through that charming and innocent conduct of your chairman, who seems to me not to have been originally intended for the jewelry business, but to have been more adapted to clerical occupations. [Laughter]. I have often thought there was a good clergyman spoiled when the American Watch Company was formed! But if he could run a church as well as he can run that institution, all I can say is, that Gospel privileges wouldn't be as cheap as they are to-day. But, gentlemen, our friend, Mr. Appleton, has given me the secret, and I am not disposed to gainsay the profit of your business because I have profited by it, by two of the most charming dinners I have ever attended in my life. [Great applause].

THE PRESIDENT—I shall ask you to give your attention to the next regular toast—"The Judiciary: May our balances be true as the scales of Justice, in the hands of our Judges," and I shall introduce to you, with a great deal of pleasure, our honored and respected guest, the Hon. Judge Brady.

RESPONSE OF JUDGE BRADY.

Mr. President and Gentlemen: To be invited to a dinner given by gentlemen who deal in such brilliant subjects, and whose manipulations redound to the credit of art and to the æsthetics of life, is an honor, a credit, and a distinguishing circumstance. But to follow a fellow like Bailey in an after-dinner speech is neither an honor [laughter] nor a credit, [laughter] nor a distinguishing circumstance. [Applause.] He belongs to an institution which is known as Charities and Corrections, and he expects to receive—and I am glad to see, in consequence of the penitential spirit of the City of New York, he does receive—more charitable considerations and less correction than any other man. Seated as one of the despots of the City of New York over on Third Avenue, under the sweet and benign influence of rapid transit, he listens and forgets; he forgets and refuses to obey. This reminds me very much—and I don't know why it should be so—of an Irishman I saw at the Lakes of Killarney, a place to which I think Bailey, even if he had gone, might have gone with very great credit to himself and have improved his morals, more especially. He said, when I reached the point where the wagon ceases to carry you, "Now I think you'd better take a pony, and not be walking through here, because you will spoil your shoes by the mud. It will cost you only half a crown for a pony, and half a crown wouldn't be much for a gentleman like you. I think you had better take a pony. And why should you hesitate about taking a pony? Is it afraid of them ye are? You don't understand the constitution of the Irish horse; they are so foine; and as for the Irish ponies, ye needn't be afraid of them, for they have one element of character that is better than any other," Says I, "What is that?" speaking for the first time. "They are like game-cocks," says he. Says I, "What?" "They are like game-cocks," says he, "they would sooner die than run." Now, Bailey, although he pretends in other places, when he is not dining at a magnificent banquet like this—and, by the way, he never misses an opportunity to go to a banquet—he is not only the "fourteenth man" of the City of New York, but he is the cosmopolitan "fourteenth man!" He is to be found everywhere where a good "spread" is to be placed before him. I am after Bailey. Bailey has been abusing me for the last three years. He abused me at the New England Society, and he stated there, as President of the New England Society, among intelligent people, that the map of New England presented the map of the entire world! Now you know he is a gentleman that has mild ways with him, soft as the touch of a velvet flower. A woman might walk all around him and she would never have a sense that anything was wrong. He is is a naturalist, but he is not a bigoted one. He is like that Irishman of whom I have heard lately who was found drinking by his boss, who was very anxious he should become temperate. He said to him, "What, drinking again?" "Yes; but it is only a few drops." "Well, but I thought you were a teetotaler." "Yes; you are right; you know I am, but I am not a bigoted one." He is not very unlike that man who, having gone to a dinner party, as my friend Schultz does very frequently, and gone home in a very questionable condition. [Applause.]

I am speaking now of Schultz, the Reformer—[Laughter]—who, having gone home in a questionable state, got into bed with his umbrella. "What are you doing with the umbrella?" asked the wife. "Well," said he, "I am preparing for a storm!" [Applause]. And if there is any man on the face of the earth who is preparing for a storm, it is our friend Schultz. He is the great reform weather "Probability" of New York. In the perfections of human institutions, Mr. Schultz, himself, has the most unbounded confidence, and he is a living illustration of the fallacy of his own doctrine, because he is the most magnificently imperfect human being I ever knew. Now, I love Schultz; I have always had the greatest affection for him. He has abused me—just think of that!—an unwarrantable effeucc. But he thought it was justifiable, and I think it was justifiable, too, and that is one of the greatest credits I can accord him. But he was wrong in his facts. Sometimes the judiciary are wrong in their facts: and who is responsible for it? The people who appear before them. We sit up there on the bench, to gather in facts; Schultz comes along, and tells one story; Bailey comes along, and tells another story; and now, who is to be believed? I submit that between Schultz and Bailey, it would be a very difficult thing to decide. [Applause]. These are embarrassments that do not occur to you in your business, while you are producing articles to delight all the senses of which men and women are possessed—especially women; there are certain defined rules of art, and when the rules of art are undefined, you create them by your superior genius, But it is not so with the judge. Your sphere is distinctive, and you keep enlarging your art all the time, until everything that is possible to be conceived in the working of metals becomes the very personification of the Beautiful. And the beautiful is the most admirable of all things to be presented to the temple of art for the admiration of the heart. But judges cannot do these things. They always deal with the infirmities of human nature. Did it ever occur to you? Mr. Jones says he sold $25 worth of goods to Mr. Brown, and that Brown promised to pay him. Brown says he did not. Now, who is to be believed?

[Several voices.—Brown!]

JUDGE BRADY—Then, that being the case, Jones is "done" Brown. You see the judiciary have to indulge in a very broad field; we have to accept such men as Bailey, such men as Schultz, such men as Bartlett, the lawyer of the Jewelers' Association—God save America, and may the Lord have mercy on you! But if the members want any professional business done, I suppose that he will do as well as any of them. That is, he will open the oyster and present the shells to each side. When I saw Bartlett here to-night, he reminded me of the story of the chap who went into a little village in pursuit of a lawyer to collect a bill for him. The lawyer asked his name, and, being told, said that he used to know the chap's father, and consequently he would take great interest in the matter and would pursue the claim to the bitter end, and would get it all, directing him to call in about ten day's time and get his money. The man called as directed and received a roll of bills from the lawyer, who went on to expatiate on how successful he had been and how fortunate it was that he happened to know the man's father, and while he was expatiating the man counted the money, whereupon his face assumed an expression otherwise than pleasing. "What is the matter?" said the lawyer. "Well," said the client, "what a fortunate circumstance it is for me that you didn't happen to know my grandfather." But America, notwithstanding she is several thousand miles from Europe, is of as much if not greater importance in many respects than Europe, or anything that the other side can produce. I have just visited my native land for the first time in years, and everywhere I went I heard of nothing but the silverware of Tiffany & Co. I am reminded now of the two Scotchmen who were in a boat when there was a storm at hand, and they were frightened, and one finally asked the other, "Donald, can you pray?" "I dinna ken, whether I can or no," was the reply. "Well, you better try." So Donald commenced, "O Lord, it is a long time since I have asked you"—"Stop!" said his companion, interrupting him, "stop! we are beholden to no man, the boat is ashore!" When I got into Ireland I found that the character of the hotels of New York was known. And what did I hear about the hotels of New York? When I was riding along to this Killarney the guide said, "Do you see the mountain there, and the cottage into it?" "Yes." "The cottage now is occupied by a descendant of Kate Kearney, And did ye ever hear of Kate Kearney? When she got on top of the mountain and let go her hair it fell down to the base of the mouutain." I said "that is a pretty good story." "Yes, said he, "but that is nothing to the stories I heard of some American gentlemen that came out here a short time ago. I will tell you one of them. They said, speaking of hotels, that they had a splendid hotel in America, New York, called the Fifth Avenue, and that it was so large that the table in the dining room was three miles and a half long, and the waiters rode around on ponies to serve the guests." May your bills against responsible parties be three miles and a half long, and may you require ponies to ride around for their collection. [Applause.]

THE PRESIDENT—I ask your attention, while I read the next regular toast—"Morality in Trade: The Keystone of the Arch on which Success must Rest;" and I shall call upon our friend, the Rev. Mr. Tiffany, who is present to-night, to respond to this toast.

RESPONSE OF THE REV. MR. TIFFANY.

There is an adage that says while "Speech is silver, silence is golden," and I presume I am called upon as a clergyman, in the midst of the brilliant talk that we have heard, and shall hereafter hear, as a little interval of that silence which Oliver Wendell Holmes says comes to heal the blows of sound, I have been given a sentiment which sounds more like a text. I think my little remarks may sound exceedingly like a sermon, and knowing how the modern mind likes brevity in sermons, my sermon shall be short. If it is a fact that I have been asked as a clergyman to respond to this toast, because it is intended that I am one of the clergymen who believes that morality is the true outcome of religion—the only outcome which is of much value in our intercourse with our fellow-men—the essential outcome which makes religion to be remembered as no ecclesiastical splendor can do, then I thank you for it, for that is my deep conviction, and that is my precise view. There is nothing which so indicates the reverence of man for his Maker, as morality in his intercourse with his fellow-men. I am sure that you, gentlemen, here assembled, so fully respond to the truth of that sentiment, that I need hardly dwell upon it. It has become a maxim ever since the Christian religion has been diffused among men, that not only is honesty right, but that honesty is the best policy. If a man is honest, simply because it is the best policy, he is not honest in soul, although in act. But what is "policy"? Isn't it the adaptation of circumstances? Is it not that condition in our affairs in relation to surrounding circumstances, which brings success and thrift to the universe? A business life is founded on the principle that the honesty of man brings success. Does it not show us that the truth, and righteousness, and honesty of man as the very base of our lives, and that the only true way to accomplish our object, is by following this rule through life? Religion which abides in the church, is a reverent, and a pure, and a noble thing; but it it does not walk down to the counting-room with us, it is not worth a snap of the finger. [Applause]. And when religion walks down to the counting-room, it does not think it desirable to speak with men in season and out of season, about their souls, but to carry its honesty, and principle, and brotherly kindness to our fellow-men, so that they, not hearing our words, but seeing our good deeds may reverence the Father which is in heaven. [Applause.] Now, I recollect a story of two Scotch elders, who—as some elders have been known to be—were of a very parsimonious nature and very hard-fisted in their dealings. One day the reverend clergyman departed from his rule and descended to speak of men's relations to each other, and preached a glowing sermon against covetousness, which he stigmatized as idolatry, and he brought up instances which rubbed rather harshly against the elders in the church. As they went out one says, "Well Donald, what do you think of that?" And the other said, "Too worldly! too worldly! he preaches works," I am one of those who preach "works;" who believe in the outcome of the true principle, as you believe in true workmanship as the true outcome of true skill and inspiration. You value your work, not for the handicraft which is brought out in it, but for the thought which is represented in it; that in the gold and in the silver that you manipulate there is room for the expression of a true human sentiment; you bring these materials out of their crude forms and make them expressive of a living thought and the representative of a divine spirit of beauty, Thereby you are cultivating the taste of the community; thereby you are making your contribution to the intellectual and social life of men and women, as well as to the mere ornament and adornment of men and women. It is often said that clergymen have very little to do with the adornment of life, and that their voices should be set against the rage for dress and ornament, and all that sort of thing which beguile so many frivolous and unstable souls; but I do not think that in the great Bible, which we all revere, so much imagery about the Heavenly Jerusalem and

the heavenly character of the earth should be compared to gold and silver, if there were not a true use in them. I cannot believe that our Great Maker put the diamond and the emerald, the ruby and the sapphire, in the rocks, except good men should find a lesson of His love, and that they should make out of mere stones, jewels, and bring out of the mere gold and silver those artistic creations which really tend to elevate, by the forms in which they are prosented to our eyes.

When Hiram and his artificers were called to build the great temple of Solomon, they were endowed with great understanding, and they consecrated themselves to the Lord in their work, and if you will hold that morality is the keystone of the arch on which success must rest, honorable dealing with your fellow-men in all the nairs of trade, it will commend you to their noble esteem, and also to the benediction of your God. You are to act in your trade as men who scorn to do mean things, who scorn to produce unwarrantable work, to cheat the buyer by giving him that which is unworthy of his notice. My namesake here has been recognized abroad, not because he has only produced good workmanship, but because the taste and skill displayed in your trade, elevate you into the rank of artists, making you like those who paint, or cut the marble, who discover the inward beauty, and endow the crude material with it, and bring it forth for the adornment and improvement of our race, I never was more struck, than once, in making a hasty journey from the capital of Russia, In Moscow and in St. Petersburg we saw the crude material in such vast numbers—in such immense volumes—as to perfectly astound one. Miserable pictures, which deserved no name as art, were crowned with coronets, diadem, and halos of such enormous size as to make you wonder at the great riches of that great empire. Passing rapidly, as fast as the train could take me, over Austria, into Italy, what do we find? Far less of riches in the crude form, but every stone cut into the most beautiful shape that would display its proportions and brilliancy, set again in the most exquisite mosaics, to develop the most delightful colors. The difference and the distinction lay in this: that one was the mere crude riches, and the other was richness by its harmonious thought, and purpose, and skill, wrought by the mind and hand of man. Such is your vocation and your honorable calling, to take that which men have called filthy lucre, and to transfer it into something of a nobler appreciation. It is in that sensc that I think the morality of your trade in some measure depends, in this, so far as to your having to do with ideas, so far as you make it honest and beautiful, and raise it from a mere trade into onc of distinction among the arts, and in that respect, and for that purpose, I am sure your calling is honorable and true, There is nothing better that you can do to get trade out of a mere crude, sensuous condition in which it might lie, than to make this adornment a high art. We have dined around this table as gentlemen, because Mr. Delmonico—with his skill and artistic ability—has turned mere eating, and the satisfaction of a crude appetite, into a high art, as it were, spreading before us the beautiful feast with which we have been regaled, and making us feel how æsthetic and how noble, and how artistic, even the gratification of our appetites can be made. And so it is with your trade, and to make us feel that there is something in man which can adorn, and beautify, and elevate that which, in the beginning, served only for a mere sensuous gratification, and makes exquisite workmanship which comes out of your shops, an inspiration of a Divine mind, which has clothed all the earth with such redundancy of color, and such perfection of forms and words, was, indeed, the assembly of a worship through the gate which is called Beautiful. It is for this reason that I chose to be with you to-night, and I wish you God speed in your vocation. [Applause].

The President—I ask your attention while I read the next regular toast. It is customary to give to each of our guests a sentiment to respond to, but in this case the circumstances are peculiar. I am going to depart from the usual rule, and ask the next gentleman who speaks to speak for "Our Guests," and in response to this toast I shall call upon a gentleman who is identified in his business relations with an enterprise of vast magnitude, and very great interest to the material development of the city of New York, I refer to the rapid transit railroad. If the gentleman whom I have called, does not entertain you as some of the preceding ones have, he may still entertain you by information which may be valuable to you. I introduce to you Gen. Horace Porter.

RESPONSE OF GEN. PORTER.

Mr. President—I have always had an indescribable dread of appearing before Judge Brady on the Bench; I have still greater dread of coming after him in a dinner speech. I cannot help being amused at the manner in which you treat your guests. You seem to say to us, in the language of Aufidius, in Coriolanus: "I'll potch at him any way, or wrath or craft may get him." You seem to set us up in your midst, until we appear like base jewels in this brilliant setting; but when one is invited by such an association as this, he can only respond in the language of Shakespeare's king: "Bell, book and candle shall not drive me back, when gold and silver becks me to come on." I don't know why I was invited here, unless it was discovered that I was in the railroad business, and I might use my influence with the conductors in times to come. I shall occupy but little of your time. I shall take no liberties with time in the presence of gentlemen who manufacture the instruments which measure time. And if I bore your ears it will be treating you no worse than you do your female customers. I don't want to be guilty of any inconsistencies in the presence of those whose business it is to manufacture "consistencies"—"consistency is a jewel." It has not been my good fortune to make the acquaintance of this association heretofore collectively; it has been my misfortune to make the acquaintance of some of its members individually, particularly in their places of business. I enter with my pocket-book in hand; they set their eyes upon it, and in a few minutes it begins to look as if Barnum's largest elephant had set his foot upon it. If I buy so simple a thing as a pearl, I find, when the bill comes in, that I have purchased the pearl of great price! If I buy a ring it is high priced, like all the "rings" in New York. A jeweler once in Pennsylvania used to boast that during all the panics of forty years he had not once failed in business, though all the people who had traded with him had. [Laughter.] And when he was on a bed of sickness he was asked if he had anything to say, and he said the great question with him now was whether he should live. The great question heretofore had been whether he would let anybody else live. I recognize your works in gold and silver, In the manipulation of silver your organization has but one rival—the Congress of the United States. Your art is like the artillery of Boston; it is not only "Honorable," but it is ancient. It seems to date back to the Garden of Eden. Adam seems to have been the first jeweler. He fashioned the first set of ornaments for Eve out of fig leaves. We sometimes see a woman in remarkably full dress, when, if you take off what the jeweler has furnished, what is there left on her? Your art has impressed itself upon every age and upon every nation. It gilded the dome of Solomon's Temple, and it has studded the diadems in the crowns of potentates. And if printing is called the "Art Preservative," yours should be called the "Art Preserver." Wherever ranks and titles have been given, and distinctions conferred upon men, your art has been called into requisition to fashion the badge emblematical of it. My reverend friend told you that in the Celestial City, the next world, the ways are barred by pearly gates, and the streets are paved with gold. Some of you may think you can sometime tread that gold; but few doctors are ever permitted to take their own medicine.

The President—The toast which I shall ask a response to, is, "International Exhibitions: Their Influence upon Commerce and National Character, and upon Trade;" and I shall call upon our friend, Mr. Jackson S. Schultz, to respond.

RESPONSE OF MR. SCHULTZ.

Gentlemen—I have no doubt you sympathize with the clergyman who spoke, and you will sympathize with me being sandwiched in between these gentlemen all the evening, [Laughter]. But I am to speak a few serious words in regard to a matter that is moderu in its general features and character, being not more than twenty or twenty-five years old. I hardly know where to begin, because the subject cannot be treated in five or ten minutes, and I don't expect to satisfy myself or to satisfy you, in any suggestions which I may make upon this subject in this limited time. I was, as some of you know, officially connected with the Exposition in Vienna, in 1873, and there became imbued with the importance of this international question, as affecting American trade and commerce. So long as we continued to furnish the raw material for the world, we were acceptable guests on the other side of the ocean. When we for the first time, went to Paris, and afterwards to Vienna, with some goods that looked like art goods, they became jealous of us, they began to understand that we were to be their rivals. More recently, at Paris, the work has progressed to such an extent, that I am afraid now they are entirely willing to admit that we are soon to compete with them in all the works of art connected with mechanism. I was recently in company with a gentleman of very high authority, who stated that the different divisions of the earth come to America, and purchased a pound of cotton for three or four cents: America adds to it until it is worth eighteen cents; European nations add to it, until in France it becomes of the value of $2.56. Now, if France and the south of Europe can make up this pound of cotton to be worth $2.56, that sum being all labor except the original eighteen cents, the question with us is, how long shall they continue in that work to our exclusion? I think Mr. Tiffany has answered that question, with his exhibit at Paris. There was the French Exhibition, when some member of the trade of which I have the honor to be connected, sent to Paris some calf-skins, which so alarmed their manufacturers, that they saw their downfall in that small exhibit. To-day we are equalling France in all her leather products. In London, twenty years ago, I met a gentleman of Philadelphia, whom I hoped to see here to-night, and I asked him, "Where can I get the best gold watch and chain?" He said, "In Newark, New Jersey." That was news to me, and I profited by the suggestion.

I venture to say that there are not more than a small percentage of people who know that Newark, New Jersey, is the best place to buy some kinds of jewelry. Why don't they know it? Because you have not told them so. Because you have not gone to all the international exhibitions and said, "Here are my art goods." You did not go to Vienna with your goods, One gentlemen, whose countenance I recognize at that table, did go to Vienna with a few art goods, and created a perfect surprise. The whole value of the goods he brought was not five hundred dollars, and he was so modest that he came near not placing them on exhibition. And yet they have been imitated in all Southern Europe, to my certain knowledge. The trade with which I am connected is not an art trade, and yet we think that leather manufactured in some forms may be artistic, Some of you who are acquainted with the leather trade know that the business, which has been exclusively confined to Vienna, will be so no longer. Russia has made us the goods in the rough state as only she can do it. They are sent to Vienna, made into art work, and then scattered broadcast over the world. But the time is not far distant when those goods will be made for twenty-five per cent, less in the cities of New York and Philadelphia than they have been made in Vienna. If that is true of leather, we know it is true of silver and gold worked up into high arts, and if it is true of that what other goods are there of which it is not true? This gentleman to whom I have alluded, Mr, Rice, the Governor of Massachusetts, occupied the attention of an audience upon the problem as to the various raw materials of which the earth is possessed, giving England two or three. Germany two or three, Austria one, and so on, but he gave America the whole. And with all that wealth in its natural form, shall we be content to send it forth to the world in that crude state, or shall we send it into the world worked up into this high art, of which those gentlemen have told us worked up, so that the pound of cotton shall not be worth eighteen cents as heretofore, but $2.56, as France has been giving it to us? And we can only attain this by attending the Worlds' Expositions. America cannot afford, as in the past, to be absent from these Expositions. Mr. Tiffany, if he would tell you the truth, would tell you he had been greatly disappointed and greatly surprised at his success; but if he had been in Vienna in 1873 he would have been more surprised to see America carrying off the prizes with a very insignificant exhibit. Can we afford to remain absent whenever there is to be another interuational exhibition? [Applause.]

The President—We have reserved the best of the toasts for the last, "The Ladies," and shall call upon our old friend Mr. Bartlett to respond.

RESPONSE OF MR. BARTLETT.

Mr. President and Gentlemen:—I feel I should be "duller than the fat weed that rots itself at ease on Lethe's wharf," did I not strive at this. This toast is certainly one that any man with half a heart and the memory of his mother flesh, would get up in the night and walk half a dozen miles in the storm to respond to; and I wish to state at the outset that I don't find any fault with the toast; that as a true knight I step into the imminent breach that is here presented without the slightest hesitation or fear of the consequences. And I wish to make an admission right here, and I hope the presiding judge will note it on the record, that if a man has to speak at all, this is the toast to speak to! This is the toast to struggle for; it is the toast to fight for; it is the toast to get at any price. Now, with this preliminary statement, I will set myself all right with the fair beings whose virtues and good qualities I am called upon to celebrate at this time. But before I go to the jury on this question, I wish to raise a law point on my worthy friend, the President of this Association. A few days ago I was called upon by his accredited agent and informed that owing to the fact that on the two annual occasions of your banquet having addressed the Association, I would be relieved from speech making to-night; I was not even to sit up here, with the aliens and strangers, but I was to be put right down there with the elect and favored; that I was to be a manufacturing jeweler, doing a large business, and expected to eat a good square meal and listen to the "feast of reason and the flow of soul" that was to be supplied in rich abundance by others. Upon these representations, and fully believing the same, I accepted the invitation to this dinner. Then, at the eleventh hour, and with a discrimination and a display of great skill that I can but note, although it is at my own expense, the President tendered to me a toast that no man can decline, and I have every reason to believe that he rejoiced at the plight in which he put me. He knew I would come here, wondering what I was to say, and that his victim on crossing the threshold would be seized by Delmonico's legions and put through a gradual but well known process that would unfit him for any mental effort; music low and distant would fall upon his ear, like that heard in the dreams of youth—wine would flow until summer should lurk in the blood and sing its hot sweet song. Every dish that could tempt the palate would pass before him in delicious procession, and finally when he had reached that stage when an indescribable spirit of repose should steal over his

senses, then he would be summoned— dragged to the fore—confronted with his toast. I don't call that murder in the first degree, or assault with intent to kill, but I think it looks like obtaining goods under false pretenses, and I make the point for what it is worth. But we must proceed to business. There is always a woman in the case. I have no doubt your worthy President supposed he was justified in sacrificing any one man on the altar of the fair sex, and I don't know but he was right; I think it is better that ten thousand men should perish than that one woman sho ld be unrepresented here. She is excluded from this banquet hall, where the bachelor and the benedict meet on terms of equality. I am a bachelor, and I admit that for an hour or two all the benedicts here are my equals. And I think it was perfectly justifiable that the ladies should be represented here. In fact, I think they ought to be here and grace such a scene as this with their presence, and I hope the wretch who excluded them has l ng since passed to that fate which he justly merited. We have heard to-night about various things - the judiciary, rapid transit, morality in trade, international expositions, and all sorts of minor subjects, which are well enough in their place, but when you talk about power—about force—there is something in its incarnated form in the shape of woman, that so impresses the seeker after knowledge in that direction he has found its highest type, he immediately abandons all further search for what he knows is the unattainable. I think Shakespeare says, in "Measure for Measure," that when women sue, men give like gods; but when they weep and kneel, all their petitions are as freely theirs as they themselves would owe them. Thus has the great High Priest of human nature given voice to a truth which has been the property of humanity ever since the morning stars sang together, and will be its property to the last moment of recorded time. And, gentlemen, this sentiment as thus expressed, gives us the serious side of this question, for it shadows forth the greater truth, that woman rules the world. Now it seems to me there is nothing so impressive in nature as to look upon its great forces unrestrained; the tempest, the fire, the flood, are all appalling: and yet, the whispering night wind, the bark log fire on the domestic hearth, the river flowing peacefully to the sea, are beautiful and restful. Now so is it in the moral world. There we see a woman, with all her beauty and all her marvelous power, liuked to passion, and we find men standing silently, mutely by, as they do when the tempest, the fire and the flood do their wild work in the midnight hour. Such a woman stands as did Guinevere in her awful dream described by Tennyson, upon a vast and desolate plain, with her shadow cast eastward by the setting sun, over cities fired—over desolations that no man could compute or comprehend. I am aware of no higher tribute I can pay woman to-night than to bear witness to the fact that while she is a power in the land, greater than all others combined— while she is capable of changing herself into a desolating force of which the wildest elements in nature are but imperfect symbols, yet is she like the wind that more frequently fills the peaceful sails of commerce than wrecks the sailor; she is like the fire, that more frequently warms and cheers than devastates; she is like the sun, that carries health and healing in its beams more frequently than it is the messenger of death, and therefore we do well to enthrone her over all the things of life; we do well to place in her hands the scepter of our power. As a result we have this blessed world of mothers, wives and sisters, these myriad homes in which dwells a pure sweet presence, making them holy places where man can establish in security the ark of his earthly hope. Woman is the priestess of home—on her virtue rests the whole superstructue of society—the final welfare of the State. For her ships sail the distant seas; for her the spindle and the loom are heard; for her your cunningest workman exerts his highest skill; for her all the toils and troubles of life are endured and endurable, and I doubt not that in countless cases it will be through her that the man her presence has made better will pass to where, beyond these voices, there is peace. I will conclude by quoting a sentiment that has been given to me to-night by the learned judge on my left, "Verily, thou art a golden sentence, writ by thy maker." [Applause.]

The President here announced that it was time to adjourn, stating that the Association would be happy to meet again in twelve months Thus ended one of the most charming dinners it has ever been our good fortune to attend, and we are sure that this was the sentiment of every one present.

Stolen Goods.

DURING the past summer several commercial travelers for manfacturing jewelers were robbed of their trunks while on the road. The value of the goods thus stolen aggregated many thousands of dollars. Some of them were recovered, and the thieves punished, but a large proportion of the goods taken were never found. Recently the startling discovery was made that some of this stolen property was in the hands of dealers who had hitherto sustained an excellent reputation in the trade, and were being disposed of in different parts of the country. Investigation led to the discovery that the parties claiming to own the goods, had bought them, through a broker, from a well known receiver of stolen goods. The "respectable" dealer frankly admitted that while the circumstances under which they made the purchases were so peculiar that their suspicions were aroused that the goods were "crooked," but they did not know they were stolen property. This was a fact which they were not, probably, specially anxious to investigate. The goods were offered to them at less than they could be had from the manufacturers, and their cupidity being aroused, they bought them. Not being immediate neighbors of the firms that lost the goods, they did not fear detection. They took the chances, fully conscious that they were committing a wrong, but quieting their consciences with the thought that if they did not buy them some one else would—the argument of the moral coward, who is too weak to do right for the sake of the right, and yields to that temptation which appeals to his cupidity. If the jewelry trade has sunk so low that men who have been regarded as respectable dealers, have become the consorts of common thieves, receivers of stolen goods and participators in the proceeds of highway robberies, it is time honorable men combined together for the purpose of purging the trade of such dishonest rascals. The dealers who bought the stolen goods referred to, will doubtless be quite indignant to find themselves classed as common receivers of stolen property, and denominated as equally guilty with the thieves, but they have placed themselves in precisely that position, and must take the consequences.

But this transaction is but one out of several that have recently come to our knowledge. We hear of so-called honest dealers buying diamonds, and other valuable gems, at less than one-tenth of their value, and boasting of their "good luck." These men are fully conscious of the fact that such goods are "crooked"—that they must have been stolen. They could not be offered at such prices because of the distress of their owners, for such goods always have a positive value in the market, and a person driven to the extremity of selling them can always get the market price. There is not a man in the business that does not have his suspicions aroused when goods are offered at less than their intrinsic value, and honorable men will utterly refuse to have dealings of any kind with the class of persons who offer them—if they are not the actual thieves, it is fair to suppose they represent thieves, and are no better than they. It is astonishing that men who have devoted years of hard work to building up a business and a reputation, will sacrifice all for the sake of a few dollars gain. They are certain to be found out sooner or later, when no money could compensate them for the disgrace that attaches to them. That is a hackneyed old adage that says "honesty is the best policy," but, old as it is, every day furnishes fresh illustrations of its truth. Dealing in stolen goods, or in goods that have a suspicion of "crookedness" in them, is certainly not an honest proceedure, nor is the person to be envied who indulges in it, even though he makes a fortune thereby. With the numerous travelers on the road in these days, every one of whom knows the goods manufactured by all his neighbors, the possibility of concealing stolen goods is not great, and this fact should deter all persons who seek to maintain a reputation for respectability to abstain from handling them, even though their conscience may not rebel at the idea.

American Electro-Plate in England.

THE *British Mercantile Gazette* comments on the fact that American electro-plate goods find a ready market in England in preference to the plate goods for which the manufacturers of Sheffield have so long been famous. The *Gazette* says: "We hear of one or two large export houses that are buying American plate almost exclusively, and who have well nigh discarded the goods of Sheffield houses. American travelers in this line visit England three or four times a year, and their pattern books are freely distributed." The simple solution of this problem lies in the fact that American manufacturers are live, active, enterprising, pushing men, who make a study of the requirements of the markets of the world and prepare to meet them. They lay awake nights designing new patterns, and when they get an idea to suit them, they lose no time in placing it on the market. The secret of the success of the Americans lies in the novelty and elegance of their designs, and the rapidity with which new styles follow each other. Patterns three months old are looked upon as *passé*, and others must be supplied to take their places. Novelty, combined with excellence of workmanship, are what the public demands, and these are supplied by American manufacturers in the highest degree. As indicated by the *Gazette*, not only have these qualities built up for us a large export trade with foreign countries, but English dealers have been forced to recognize the demand for American goods, and buy of our manufacturers to fill their own foreign orders. The English are good workmen, but they lack originality and enterprise, characteristics which predominate in American workshops.

Proceedings of the Horological Club.

A Distinguished Body of Watch and Clock Makers.

Fifty-sixth Discussion.—Communicated by the Secretary.

[Notice.— Correspondents should write all letters intended for the Club separate from any other business matters, and headed "Secretary of the Horological Club." Direct the envelope to D. H. Hopkinson, Esq. *Write only on one side of the paper*, mail as early as possible, as it must be received here *not later* than two days before the end of the month in order to be discussed and reported in the Circular for the next month.]

STRAIGHT-LINE CENTERING AND DRILLING TOOL. AMERICAN NAUTICAL ALMANAC.

Secretary of the Horological Club:

Will some of the Club describe the "straight-line centering and drilling tool," spoken of by Excelsior, in "Practical Hints," in the September Circular? Also, where can I obtain the "American Ephimeris and Nautical Almanac," spoken of in "An Instructive Essay," of October? G. A.

Mr. Ruby-pin said that this tool was not for sale, so far as he knew. It was made by fitting up the old-fashioned steel verge lathe. A thin plate of steel is mounted on an upright rod fitting in the rest slide, in place of the ordinary rest. This plate is caused to stand exactly at right angles, or across the lathe-bed, and a number of holes are drilled through it, just large to take the pivot drills to be used. On one side of the plate these holes are countersunk partly through the plate, some shallow, others deeply, for receiving the stump or shoulder of the broken pivot. By moving the rest slide to bring the plate in a position that the point of one of the lathe centers will just fit in a hole and clamping it fast in that position, that hole will be exactly in a straight line through both lathe centers. The stump of the broken shaft, or pinion is placed in the countersink, and the second pivot supported by one of the centers, while, on the other side of the plate, a drill was inserted in the hole, and its further end supported by the other center. All the parts are now held in a straight line, and the drill will cut truly without any trouble, the center behind it being pressed forward by the finger, hard enough to cause the drill to cut.

Either the drill or the piece to be drilled can be revolved with the bow, but the former is preferred, and the staff is pressed tightly into its countersink, and the center clamped. The staff is turned a little, occasionally, with the thumbs, to insure truth in the drilling. The centering is generally done with a special drill, or centerer, having a round, cylindrical body, smaller behind the head, like a drill, but the same size to the point, and just fitting in the hole in the plate. Its cutting point should be formed exactly in the center of the body. The countersink brings the center of the stump exactly opposite the point, which cuts a cavity there, and as soon as this is deep enough to guide the drill, the centerer is laid away, being used only for marking the center. For those who have no foot-lathe, this tool is almost indispensable, as by it a true job can be done easily, quickly and surely. It has been more or less known to the trade for a number of years, and he had often wondered why they were not made for sale, instead of leaving every one to make it for himself.

The American Nautical Almanac, he believed, could be obtained from John Bliss & Co., 110 Wall street, New York.

TOOL FOR STRETCHING WATCH WHEELS.

Secretary of Horological Club:

Will you please inform me if there is an accurate and reliable tool for stretching watch wheels, to alter their depthing, and the price of same? As a watch repairer, I enjoy reading the proceedings of your Club. G. W. R.

Mr. Clerkenwell replied that there were three different kinds of wheel stretching tools in the market. Two use punches, the other operated with a sharp-edged roller. All would do good work, if properly used. They can be obtained of any material house. Price, $3.50 to $5.

TO ASCERTAIN THE RATE OF A CHRONOMETER.

Secretary of the Horological Club:

Please inform me of the best and easiest mode of ascertaining the rate of a chronometer, as I have never had the opportunity of performing such work. Having removed to a seaport town, where such work will be required, by giving me the desired information, you will greatly oblige A Subscriber.

Mr. Regulator replied that for surely ascertaining the rate, it only required to compare it frequently with an accurate standard clock. But before the rating was attempted, the chronometer must be in the best possible order; the adjustment of the hair-spring for isochronism, and of the balance for heat and cold, should be perfected, otherwise the rate might seem very close for a certain amplitude of balance vibrations, and a certain temperature, but be utterly unreliable for any different vibration or different temperature. Directions for making these adjustments, or testing and correcting them, would take more space than our entire proceedings, and then be only a mere outline of the subject. He would recommend "Subscriber" to get Excelsior's book, published by the editor of the Circular, price $3.50. He will there find full directions for the above adjustments and rating, besides a great number of other points of value to every workman who wishes to know how to do good work.

WANTS A BOOK TO LEARN THE TRADE FROM.

Secretary of the Horological Club:

Can you inform me whether or not there is a book or books now published, for the aid of watchmakers, repairers, etc., giving best mode or different modes of repairing watches in all of its different branches, giving practical instructions for such as have never been so fortunate as to be able to serve an apprenticeship, etc., for such as are self-made workmen, who never had any instruction in this branch of business, yet who have obtained eminence and popular reputation as good and careful workmen? Such is my case, and though it has cost me a world of experimenting and careful observation, I am proud to see and know that my work gives entire satisfaction. Yet I am often puzzled to know how to do some kinds of work, being more puzzled in the mechanism of the escapement and in hard-soldering, brazing, etc., than in anything else. If there is any such book or books, give me prices, please, and address of publishers, so that I may be able to get the same. I desire to rise higher in the art, as botchery will in no way satisfy persons of my ideality and make. L. W. B.

Mr. Horologer had replied to this letter, which the editor had sent to the Club for an answer. He said he had all his life heard a great deal of some men being smart enough to "pick up" the trade themselves, without any instruction at all. But he had never seen any one who had picked up any alarming amount of skill, and he did not believe that that man lived who could acquire a real understanding of even all the more common principles which underlie the general run of work in these days. He might study out enough of it to get along with ordinary jobs, when they were in tolerably good order, but anything much out of the common run would infallibly swamp him. For an example: Who could study out by himself the principle of the different escapements in use, so that he could discover an error of construction or proportion; tell where the maker had erred in his design, and how it should be? Then there is the proper length, form, etc., of the balance-spring, to secure isochronal action; then proportions of balance-spring, balance and mainspring, to be suited to each other; the construction and treatment of the balance, to compensate for heat and cold; the principles of correct depthing, gearing, shapes of teeth and pinion leaves, and proportion of wheels to pinions, making and polishing jewels, and numerous other points, which a good watchmaker must understand the present day.

All these things are the results of the labors, studies and experiments of hundreds of eminent men, many of whom have had all the advantages of thorough education, strict training by skilled masters and long practical experience. He pronounced it utterly impossible for any one man to study out even a tithe of these things for himself, and only a small share of men could attain eminence, even under the best of instructions. But of course, the more one availed himself of the labors and discoveries of others, the higher he could reach, and the easier the ascent would be. Personal instruction by a competent workman, was the most valuable of all, although not entirely not indispensable. Much could be learned from books and by study, but at a great disadvantage. But with careful and thorough training as a foundation, further progress was limited only by one's own capacity, application, and adaptation for the work.

There are some things which books alone cannot teach. They must go with study and practical working, to be of the most service. Books are guides and Mentors, but not substitutes for personal application. In the latter sense, or, books from which to learn the trade, none could be found, nor could any such be written. The editor of the CIRCULAR had endorsed Mr. B's. letter, "$1,000 is offered for such a work as he wants;" and he might safely have offered a hundred times that amount, and there would be no takers. But even in the former sense, or as assistants to the student of the science, works in our trade are very few, and they mostly in French and German. The cheapest and most reliable sources of printed information are the trade journals. Of these there is but one in this country worthy of the name—the CIRCULAR. In it will be found Practical Hints on Watch Repairing, by Excelsior, and valuable articles by other writers on all the different topics of interest to our trade.

As for books on escapement, called for by Mr. B., there is M. Grossman's Treatise on the Detached Lever Escapement, published by the author, at Glashutte, Saxony, Germany, price twelve shillings sterling; also, M. Saunier's French Treatise on Modern Horology, the translation of which has been begun in London, to cost forty shillings sterling, when completed. There were one or two others which he believed were now out of print. Excelsior had also written a series of articles in the CIRCULAR, running from the latter part of Vol. VII to the middle of Vol. IX, on the four principal escapements—the cylinder, detached lever, duplex and chronometer. These are as full and well adapted for the use of the actua. workman as anything well could be, and differed from others in being more practical. After showing how a part or action should be, they went on to give methods of making them so, testing, etc. Whether those numbers of the CIRCULAR could yet be obtained from the publisher, he did not know; but as the demand for them had been great, it was probable that only the present Volume could be got, with possibly a few copies of Vol. VIII. Beyond those specified, there are (in English) only occasional articles in the horological periodicals here and abroad.

OILING STEEPLE CLOCKS.

Secretary of the Horological Club:

I have a steeple clock to clean. The movement is on the third, or upper floor, and away from artificial heat. Would you advise the oiling of any of the pivot holes and bearings, save the escapement and the loop through which the pendulum-rod passes? B.

He should oil all the points of the train. The evil effects of oiling will be less than that of letting the pivots run dry. But only good oil should be used, and the shoulders of the pivots should not be too broad, if they run in contact with the faces of the clock plates or frames.

TO MEASURE THE LENGTH OF A STAFF.—TAKING OFF THE BACKS OF ANKER ESCAPE WHEEL TEETH.

Secretary of the Horological Club:

Will you please answer the following questions for my benefit, and the craft at large? 1. What is the best and most correct method of taking the measure of a staff from end to end of pivot, where old one is lost? 2. Is it right to cut off the backs of an anker scape wheel tooth, where it catches on the pallet, and won't unlock? I maintain it is wrong, and injures the ime, while a brother-workman contends it is right. What would be your method in such a case?

PIVOT.

Mr. Uhrmacher said the proper way to measure for the length of staff was, first, to take off both end stones, fit the balance-cock properly to the plate (level, etc.), and screw it fast in its place. Then, with the degree guage take the measure from the outside of one hole jewel to the outside of the other one, and to this add the amount of end shake the staff is to have, which gives the exact length of the staff between the extreme ends of the pivots. The length should be such that, when one pivot rests against its end stone, the top pivot shall come level with the outer surface of its hole jewel, and the same when resting on the other pivot. The end shake should be equal to the distance from the outer surface of the hole jewel to the adjacent surface of its end stone, when fastened in place. If this distance is neither too great nor small (the jewels must not touch), the end shake will be correct. A safe way for length is to take the outside measure from the surface of the sink in which the bottom end stone fitting rests, to the top surface of the balance cock. Then having screwed on one of the end stones, shorten up either or both pivots of the finished staff a trifle, to bring the top end of the other pivot level with the surface of its hole jewel, as before explained.

As regards taking off the backs of the escape wheel teeth, that must be done if the wheel and pallet action is otherwise correct, as the wheel must be made to escape, or the watch cannot go. But before doing that, see how far the teeth lap on the locking faces of the pallets. If the depthing is needlessly deep, the pallets had better be moved back from the wheel, to let it escape. In such a case as that, taking off the backs of the teeth would lessen the angle of lifting, or impulse, and cause a loss of that proportion of the motive power, and also leave the lockings excessively deep, and cause another loss of power. But moving the pallets back would leave the full lifting angle undisturbed, and also lessen the useless locking and drop. But if the teeth, when they fall upon the pallets, only lap on them enough for safety, the pallets cannot properly be moved back any, and if the wheel will not escape, the backs of the teeth must be taken off barely enough to free them. Sometimes only one pallet arm will need moving back. Mr. Pivot will find all these points tully treated in Excelsior's articles on the Detached Lever Escapement, in the CIRCULAR.

AN APPRENTICE ON EXCELSIOR.

Secretary of the Horological Club:

I want to say that Excelsior's articles are now just the thing that we apprentices like, about common work—something that even an apprentice can understand and put in practice every day. Heretofore his subjects have been rather above us—too far advanced to be quite adapted for young workmen. I hope he will not be afraid to give all the little details. They may seem rather small and common to him, but they are very important to us. I hope he will not take offence at my liberty in saying this, as I mean none. I feel too much respect and gratitude for what he has done for us, who want to learn.

APPRENTICE.

Mr. Isochronal assured Apprentice that Excelsior could take no offence, but would, no doubt, gladly do all he could to meet the wants of all classes of readers. He probably thought that the details he was giving were quite full, and that with careful reading—referring back to previous instructions on the same or similar points, and studying how to apply directions given to constructions which might be a little different from those for which they were written—they would meet all reasonable requirements. The speaker knew, from his own experience, how it probably seemed to Excelsior. Details which would appear to him tame and trivial, almost silly—so old and commonplace were they to him—would be to others like a new revolution. Every statement—and almost every word—would be full of new and important meaning to them, and they would wonder why he had not been more circumstantial and elaborate in his descriptions. He agreed with Excelsior that there was a limit to what written instructions could teach, and what they should undertake to teach. His articles were based on the supposition that the reader has some practical knowledge of the use of tools, modes of working, etc. On that view, the details given were all that were really needed and advisable, for he was writing for all classes of readers, and could not give too much time to explain little matters, solely for the benefit of very young workmen, thinking, and very justly, that they should learn some things at home. The explanations were full enough for the great mass of readers, and if apprentices would study them more closely, they would find them plain enough.

REMOVING RUST FROM PINIONS.—TO SHAPE UP TEETH WITHOUT ROUNDING UP TOOL.—TO ALTER ENGLISH LEVER STOP WORK.

Secretary of the Horological Club:

Please permit me to present to your honorable members the following questions, deeming several of them worthy of their consideration: 1. What is the shortest method to remove rust from pinions? 2. To shape, or round up the teeth, without rounding up tool? 3. To alter the stop-work of an English watch, without taking it apart?

It occurred to me several times that previous to cleaning and during the trial the stop-works would work all right, but when together it might not do so. E. P.

Several of the members participated in the discussion of these inquiries, but the conclusions were as follows: The best way to remove rust is to scour them up with oil-stone dust and oil, till a smooth surface is obtained, then polish with crocus. Care must be taken not to grind the leaves off any more than is necessary, or the proper shape may be destroyed. Some workmen soak the rusted parts in a solution of cyanide of potassium, or other solvents of oxide of iron, but the use of such means were not approved of. The way described is as good as any, and is safe. If the pinions are very badly rusted they should be rejected, and others put in, as they would be out of shape when finished off smooth, and would not operate well in the watch. The teeth of wheels could be shaped up with the "cone-rounders" described by M. Grossmann, in a letter read before the Club, about a year ago.

As regards altering English lever stop watches, without taking the watch apart, Mr. O'Lever thought that our correspondent could not have tried their operation very thoroughly, as it was not likely that he had bent the parts in cleaning them, and if they really were right before cleaning, they would be so when put together again. It is scarcely safe to try to bend the stop bar in the wateh. It should always be done, when absolutely necessary, when the chain is worn off the fuzee, and safe from injury. To bind the end of the bar up, put a wedge between the bar and upper plate, just over the "passing hollow," for the chain, then, with a thin screw-driver, or any like piece, rest the end of it on the steel cap over the fuzee, and pry the end of the bar up, bending it a little at the thinnest place, where the wedge is. Never rest the pressure of the screw-driver on the brass of the fuzee, nor on the beak of the cap, as that might break off, or at least bend. To bend the end of the bar down, put the wedge over the end of the bar, and press up against the passing hollow, with any tool that is most convenient for you, but never rest it on the fuzee.

But the best way, of course, is to make a more thorough examination and test of the parts, so they would not require this bending after putting together. As Excelsior is expected to write on the English lever soon, in his Practical Hints, Mr. O'Lever said it would be unnecessary, as well as presumptuous, for him to undertake to do so in advance.

GUTMANN'S AUTOMATIC HAMMER AND PUNCHES.

Mr. McFuzee then exhibited the above-named tool, which has recently been improved, so that a slight pressure with the thumb on a sliding piece, like a trigger, sets it off, and gives a blow on the punch. It is very easy to operate, gives a heavy blow, and makes a very handy tool for many jobs, taking the place of a third hand. The members present were highly pleased with it.

WATCHMAKERS' TROUBLES.—NO. 5.

Secretary of the Horological Club:

I must impress upon the mind of any young man that wishes to become a good watchmaker or repairer, that he must have a good stock of patience, good eyesight, and a very steady hand; and that if he is receiving instructions from a man that thoroughly and practically understands the business, he must follow his instructions implicitly, and that although he may think that he knows how to make or fit a new piece, pitch the depths of an escapement, or those of wheels and pinions. He must not be too proud to show and ask his instructor if it is right, until he can go on by himself without showing. That is a fault that I have found with many that I have had under instructions in this country, that if once told that they had done anything right, would not show their work another time, but fancy they could always do it as well as their boss, and thinking it would lower their dignity by asking advice. I have had some who really had a good mechanical turn about them, who could or would not be taught to make fine work properly, because they wished to go ahead too fast, and had not the patience if told that their work was not right, to do it over again, but would let it pass if it only worked, although it was defective in the finish, etc. Others that were smart and quick in learning, if they could put in a new staff, new spring or pinion, and clean a common watch, after working for a year or two, would feel dissatisfied if they had to pass for apprentices or learners, will leave, and represent themselves as practical workmen, expect journeymens' wages, or start in business for themselves, sometimes, in opposition to their former employer, which I consider rather unjust towards the person who has perhaps paid heavily himself in money and time, to learn the trade, besides losing his time to make his apprentice competent in as short a time as possible, so that he might be compensated somewhat by his work, the latter part of his time that he ought to have remained with him. I admit that one may occasionally find a good and faithful apprentice, but I regret to say that now-a-days they are scarce, in the watch trade. I agree with what Mr. Clerkenwell says about charging a premium, etc., and having proper papers and contracts drawn up for that purpose, but I must respectfully remind him that we are not in London, where such a course is pursued. In this country I believe it would be useless, as if the apprentice chooses to leave, he can go to a distant country village or town, pass himself off as a practical workman, and get work as a journeyman, or start a repair shop of his own. The laws between employer and employee are here very different to what they are in Europe. There, no person is allowed to work as a journeyman, etc., unless he can show that he has served a regular apprenticeship at his trade Again, if either an apprentice or journeyman feels dissatisfied, and does not wish to stay with his employer, it would be the height of folly to compel him to do so, in the watch trade particularly, as he could do more harm than good to his master's business by slighting his work, etc. Such, unfortunately, has been my experience in attempting to remind them of their agreements. It is a very difficult thing to suggest which would be the best way to take apprentices. My plan has been to pay them small wages at first, and if they like the business, increase their pay as they become more proficient, endeavoring to treat them in such a manner that they would not wish to leave, still letting them understand that I am their boss, and that they must follow my instructions, etc.; but still one is often deceived, as I have myself been treated meanly, particularly by some young men who could work some on common work, but wished to improve themselves on fine or complicated work, I would pay them liberal wages, and would put them forward quickly, expecting that they would afterwards be useful to me, and that their work would compensate me for showing them what had cost me years of toil to learn; but in some cases they were more detrimental than good to me, as after they had learned all they wished, and thought I could not get along without them, they wanted as much pay as experienced workmen, or would slight their work, etc., so that now I find it better to take no more apprentices or improvers, but if I have more work than I can do myself, I employ those whom I know to be good and skilled workmen, paying good prices, and if they do not do work as I want it, or charge exorbitant prices, I try others. I should advise any young man that wishes to learn the watch business thoroughly, and in every part and branch, to go to Europe, go to one of the Horological schools for a few years, if he wishes to become an expert at watch repairing. He may learn to repair plain watches in this country, but when he has complicated or very fine ones, unless he is mechanically inclined, persevering, patient and honest in his work, he had better select some other trade or calling. This is the candid advice of EXPERIENCE.

Mr. Clerkenwell observed that the experience of our correspondent seemed to have brought him around to his own way of thinking, about apprentices. As he remarked before, he should employ a good workman at once, and not bother with apprentices. But if overpersuaded to take one, he should have some responsible person, either the father or guardian—or two of them—go in the contract with the boy, so that in case he ran away or died, the amount of the profit or damage stated in the contract could be collected, and the employer would not altogether lose the time and labor given to instructing him in the first years of the apprenticeship.

To be sure, we are not in London, but we are not obliged to take apprentices unless we choose, and if they will not agree to such terms as will compensate us, they can stay away. We hope Mr. E., in his next letter, will give us some figures—say the wages he has paid per year to apprentices; also the premiums he charged—if any—in different cases, and other particulars, both from his own long experience and from that of others which has come to his knowledge: so that our readers who have not had similar opportunities to learn about such things, may know what is customary and proper.

In conclusion, the speaker wished to add to the advice in the last paragraph of Mr. E's letter, that any young man who thinks of learning the watchmaker's trade as a quick and easy way to get rich, or even to make money fast, had better give up the idea at the beginning, for he will find it a great mistake.

GOOD ADVICE.

Secretary of the Horological Club:

I have got to like the CIRCULAR so well, that I look for it every month with a great deal of pleasure, for in it I not only find entertaining and interesting reading, but much useful information, and I consider myself well repaid for the two dollars which will bring it to me for a whole year, regularly each month.

If I could say anything which would induce anyone not now a subscriber to this paper to take and read the same, I would gladly do so, and feel that I had done him a real favor, which he would acknowledge himself, after reading a few numbers.

By the way, the coming month would be a good time to subscribe. I know how backward we are to part with any sum of money, however small, to subscribe for a paper, when business is dull, and funds, perhaps, a little short, but there is none who, during the holiday season, would miss, or seem to miss, the two dollars required, and a better investment could not be made. I will only mention one instance of many. Some time ago an article appeared in the CIRCULAR, giving directions how to assort and correctly number lenses for spectacles, both convex and concave. Now, we all know how soon a stock of spectacles gets mixed up, and the numbers lost, and what a disadvantage it is to have them in that condition. But since reading the article referred to, I have no trouble in keeping my spectacles assorted, and numbered correctly. I would not part with this information alone for the price of a whole volume. My experience is, that a jeweler cannot afford to do without a paper like the CIRCULAR, and my honest and sincere advice to every brother-watchmaker, is: Subscribe for THE JEWELERS' CIRCULAR. A READER.

Mr. Regulator said that the letter from "A READER" was both sensible and timely. A watchmaker who would do without his trade paper, was a benighted man, stumbling along in the dark, not knowing what was going on in his line, in the world, the improvements and discoveries constantly being made, or the experience of multitudes of his co-workers, all of which would be of inestimable value to him. A well-conducted trade journal was as necessary to an intelligent man as tools on his bench. It tells him where to buy goods, how to judge of their quality, and to select what he wants; how to take care of them and to sell them; how to do work; what new tools and processes are out; about the fashions; whether prices are higher or lower—in a word, everything that he needs to know in his business, and which he will not find in any other paper or way.

The CIRCULAR ranks among the handsomest and best trade papers published, whether here or abroad. In our line its superiority to all others is so marked, that its rivals have nearly all disappeared, and it is to-day the only American watchmaker and jeweler's journal worth taking, and is the recognized organ of the trade in this country. The price, too, is remarkably low for such a paper, and he must be poverty-stricken, indeed, who cannot spare $2 for such a treasure-house of varied information as is contained in its pages during the year. He did not think it possible for any dealer or workman to read it and not be repaid over and over again. At this season, when trade and work are good, he advised that every one should make himself a Christmas present of a year's subscription to THE JEWELERS' CIRCULAR and a copy of Excelsior's book—two things that no one but a botch *should* be without, and which no wide-awake, progressive watchmaker *would* do without. We, of the Club, have had reason to know and appreciate the liberality and efforts of the publisher of the CIRCULAR, in behalf of the trade, and deem it both a duty and pleasure to give him these well-deserved words of commendation and gratitude, which we are sure will be heartily seconded by the trade at large. We trust our advice may be unanimously acted upon, and in that case, we shall feel that we are not merely *wishing*, but *assuring* to all a Merry Christmas and a Happy New Year.

Artificial Production of Precious Stones.

FROM a strictly scientific stand-point, the cynthetical production of mineral substances found in nature possesses great interest, as throwing much light upon the modes and processes which nature employs—questions often of vital interest to the geologist and mineralogist, and which the most careful chemical analysis does not permit him to decide with positiveness. With this object in view, investigators have succeeded in producing, artificially, in the laboratory, a number of mineral substances, which in chemical constitution, crystaline form, and other physical properties, are not to be distinguished from the natural products; and much information of interest to the chemist and the mineralogist has thus been gleaned. Naturally enough, the thought has often occurred to the ambitious chemist to seek to solve the problem of producing the choicest and most highly valued mineral products—the so-called precious stones—but until quite recently all such efforts have been, practically, failures, the best results being confined to gems of microscopic minuteness. We do not refer here to the imitations of precious stones—skillfully colored glasses, paste diamonds, and the like, the production of which has long been successfully practiced, but to the artificial production of the gems themselves.

The exception we have made is of sufficient importance to warrant a special notice in the CIRCULAR, and refers to the recent remarkable achievement of Messrs Fremy and Feil (the first a distinguished chemist of Paris, and the latter a glass manufacturer), in producing by artificial methods the colored crystaline varieties of corundum, known as the ruby and the sapphire, in such quantity and quality that the value of these hitherto costly products of nature threaten to be seriously impaired, and the wants of the watchmaker and jewel-cutter will be abundantly supplied for the future.

In seeking for the cause of the success of the experiments of Messrs. Fremy and Feil, we are disposed to attribute it largely to the circumstances that they were wise enough to depart from the beaten track of previous laboratory experimenters and to operate upon a large amount of material (from 50 to 75 pounds was the quantity employed), and to subject their materials for a considerable period (20 days) to the uninterrupted influence of the very high temperature obtainable in a glass furnace. The chemical reaction of their procedure involved the composition of an aluminous silicate (in this case pure porcelain earth), by means of a metalic oxide (oxide of lead). The process, as carried out at the glass works of M. Feil, consisted in subjecting a mixture of equal parts of the aforesaid porcelain earth and re-lead in a fire-clay crucible, to the intense heat of the glass furnace continued for several weeks. As the lead likewise attacks the silver which the crucible contains, and may even perforate the walls of the vessel, it was found expedient to place the charged crucible within another, to avoid the possibility of loss of charge from this cause. At the conclusion of the above described operation, and the cooling of the crucible, its contents were found to consist of two layers—the upper one vitreous, and consisting chiefly of silicate of lead, and the lower one crystaline, and containing clusters of geodes, consisting of beautiful crystals of alumina. The experiment just described yields colorless crystals, and to obtain such as shall show the rose or deep-red color of the ruby, the addition of 2 or 3 per cent. of the bichromate of potassa is necessary. The blue of the sapphire will be produced by the addition to the mixture of a small quantity of the oxide of cobalt. As the ruby and sapphire are nothing but colored corundums, it is apparent from what has been said, that the products of Fremy and Feil's experiment are not merely close and ingenious imitations of these gems, but the veritable gems themselves, and in no way to be distinguished from the products of nature's handiwork. Usually these crucible-formed gems are covered with a skin of lead silicate, which may be removed either by means of fused oxide of lead, or of hydrofluoric acid, or by other modes well known to the chemist. At times, however, the geodes are found to contain crystals that are quite pure. They have the same chemical constitution, the same hardness, the same lustre, the same specific gravity, and the same crystaline form as the natural ruby and sapphire.

The artificial rubies laid before the French Academy for examination were found to readily cut quartz and the topaz; their specific gravity was 4·0 to 4·1. Like the natural gems they lost their red color when strongly heated, and regained it again on cooling. The diamond cutters repute them quite as hard to grind and cut as the natural rubies (and at times even somewhat harder), and M. Jannetoz, a well known mineralogist, who examined them crystallographically, reported that, under the microscope, with polarized light, they presented precisely the same peculiarities as the products of nature.

It is probable, therefore, that these highly interesting discoveries may lead to the artificial production of the ruby and sapphire, and of many other gems, in such quantity and quality as to speedily reduce the commercial value of these natural products, that heretofore have been esteemed to be beyond the skill of the chemist to produce.

The only precious stone which, in the light of these advances, may be said to have yet defied all the efforts to reproduce it, is the chief of all gems—the diamond; but how long will it be permitted to enjoy this enviable distinction?

TULA silver is manufactured in Tula, Rusia. It is at present manufactured on a large scale by Zacher & Co. in Berlin, who succeeded in lifting the vail of the secret of its manufacture. Tula silver is a composition of 9 parts of silver, 1 part of copper, 1 part of lead and 1 part of bismuth. These metals are melted together in the given proportions and worked with as much sulphur as they may be able to take up. Thus a composition of a peculiar blue color is obtained, which has on that account, in some places, been called blue steel.

Practical Hints on Watch Repairing.

By Excelsior.—No. 45.

EXAMINING THE DETACHED LEVER OR "ANKER."—CONTINUED.

(706) *Stop Works.* These wheels frequently justify their name in more ways than one. Great care must be used in adjusting them, as any inequality, roughness or misfit will cause stoppage of the watch. When stopping occurs, and, upon examination, the train is free up to and including the center wheel, but the main wheel is not free but is under the pressure of the mainspring, and you know the watch is not run down, try if possible to get a view of the stop works before starting the watch. Do not turn the arbor and wind up the spring, nor press the main wheel either forward or back too hard with the tweezers, or you may change the position of the parts you wish to see, and so defeat your object. If not convenient to see the stop works before moving any of the parts, try to let the mainspring down so you can take the barrel out. In doing this do not turn the arbor forward any farther than barely enough to raise the click out of the rachet, then let it back to a rest or stop. See if the barrel is now free, remove it and examine the stop works. If they are much out of order, and the above directions were well followed, the arbor would have turned back but little, if any, and the cause of the catchr ing will be apparent. But if it turned back to its proper stopping place, we have to see which one out of a number of faults is present —first making sure that the trouble is not in the rubbing of the barrel or hook in the sink (673), of the stop works or their screw on the crossbar (674), the barrel being bound on the arbor (676, 683), the main wheel rubbing anywhere (668 to 672), etc., as before specified.

(707) See that the male stop (686) does not bind the lower end of the barrel between itself and the arbor nut (676); that its edge and finger are perfectly free from bruises or roughness and well polished; that its under surface is also smooth and free from feather edge, etc.; that it is level on the arbor; that the pin that holds it on the arbor is tight in its hole, and neither end projects beyond the edge of the stop; that it fits nicely in the curves or hollows of the female stop, leaving the latter just a trifle of freedom; and that it is fitted concentrically on the arbor square. The female stop should fit its shoulder or pivot well, but turn freely on it. Its screw head should be nicely fitted to its hollow in the stop, come just level with its surface, and, when screwed down snugly on the pivot, should not bind the stop wheel at all, but leave it free to turn. Of course the point of the screw must not project inside the barrel. When the stop works act, at either extreme, i. e., when the shoulders of the two wheels come together and stop the turning of the arbor, the finger of the male stop should point to the center of the screw of the female stop, or as nearly so as possible. The end of the finger should reach nearly to the bottom of the notches in the female stop, so that it will move the latter just the right amount to receive the male stop properly; and the diameters of the two stops should be the same, i. e., from the center to the edge of the male stop should be the same distance as from the center to the middle of the hollow of the female, or, when the hollow and the circumference coincide the contact is midway between the centers.

(708) In filing out the male stop to fit on the arbor square, care must be taken to keep the hole exactly in the center, so that, when the arbor turns, the circumference of the stop will turn in a circle. If the sides of the hole are filed unequally, one side of the male will bind in the hollow of the female stop, while the opposite side will be too far from the hollow, or too loose, and between these positions the stops will be just right. If there is any doubt, turn the arbor around, holding it in the sliding tongs, stopping at every quarter of a turn to try the freedom of the female stop. If found out of true, as described, the male stop should be rejected and another fitted properly. If the male stop is true, but there is a good deal of freedom between the two, test the safety in this way: Turning the arbor, when the finger approaches one of the notches, you put a peg wood point in the female stop and press the corner of the hollow *towards* the approaching finger. This is the opposite direction to the one in which the finger would move the hollow in passing in the notch, and if there is too much play or looseness in the stops, or if the finger is too short, or the sizes of the two stops not properly proportioned, the corner of the hollow will catch on the finger and arrest its motion. Instead of the corner meeting the finger below its broadest part, it strikes thereupon, or outside of it, and the finger enters its hollow instead of the notch. Try this while turning the arbor in both directions, but particularly in the direction of the unwinding of the spring. Whenever this fault of catching is found, fit another stop in place of the one which is too small, testing them by measuring them as described in the preceding section. If the female stop is imperfect, and points of the hollows may not be alike, all of them should be tested as above.

(709) The stop works are so adjusted that neither the first nor last action of the spring will be utilized, but only the intermediate portion. For instance, if the arbor could turn six times around without the stop works, the middle four turns would be used, thus cutting off the strongest and the weakest parts, and leaving the middle, which is supposed to be of more nearly uniform strength. The spring would be wound entirely up, the arbor let back one turn, and the male stop adjusted to stop at that point, and prevent winding any higher. This is not always the proportion adopted, but will show the principle. More often the spring is wound entirely up, the arbor let back one-eighth to one-quarter of a turn, merely enough to free the spring from strain, and the male stop put on to stop winding up at that point, thus utilizing the highest turns In other cases, the lowest turns may be selected—all depending on the peculiar action wanted, and the portion of the winding which will afford that action.

(710) This is usually determined by the use of the adjusting rod, which will be treated of hereafter, in connection with the subject of "Springing." It consists of a graduated beam or rod, on which slides a weight—one end of the rod having a pair of jaws which clamp upon the barrel arbor. Some rods are balanced, on the jaws, by a counterpoise. By sliding the weight to a point where it will balance the pull of the spring, a slight calculation will give you the exact amount of the pull, in pennyweights or ounces, at any desired stage of the winding; and its strength at different points can thus be compared to ascertain the ratio in which its strength increases. Another way is to judge of the change in the strength of the spring, by the difference thereby produced in the extent of the balance vibration. This method does not give a direct measurement of the traction of the spring at the different points in the winding, as the adjusting rod does, and moreover it requires some care ot make proper allowance for changes in the balance vibrations arising from irregularities in the action of the train, etc. But it has its value and both methods will be considered in their proper place.

(711) It is generally supposed that the object for which stop works are employed is to select particular turns, and so get the most nearly uniform strength. This, however, is really of minor importance in practiee, except with very long and thin springs. Experience shows that, in general, the highest turns will give the most nearly uniform strength. But in some cases it will be desirable to lessen the strength of the spring, even if it should not be so uniform, and the lower turns will then be selected. But with the ordinary springs, comparatively short and thick, the margin or range for such selection is very limited or entirely lacking. With them, the second method described in section (709) will give the best results. Should the spring then be too strong or too weak it should be replaced by one adapted to the requirements of the case. But, although the highest turns give the most nearly uniform strength, this merit is attended with more danger of the spring snapping off,

when the arbor nut is too small, or smaller than the center of the spring was made for (681). Unless the workman is able to judge as to this, it will be safer to follow the first method (709), and use only the middle turns.

(712) Frequently the mainspring breaks soon after cleaning a watch. In many cases the cause undoubtedly is that the spring was keyed up too high, or higher than it had previously been, although it may as often be attributed to harsh handling in cleaning (685). Besides the power of selecting such turns as will give the particular action we desire, the stop works are therefore valuable in protecting the mainspring from strain by winding. Without them the spring is more liable to break by being drawn too tightly around the nut, especially in English levers. They also save the barrel hook and the hook hole in the spring from being pulled out or broken, and prevent the adhesion of the coils by being drawn too tightly together at the center. Before adjusting the stop works, see that the nut is screwed firmly to its place on the arbor, otherwise it would turn on the arbor after the stops were adjusted, and so let the spring down lower than it was intended to be for running, and perhaps bind the barrel (676). Also be sure that the barrel head is tight, so that, when the shoulders of the stops meet, the strain of the key will not move the head around and produce the same result of letting the spring down as just noted.

(713) We have now reached the end of our movement, and corrected its defects, so that when cleaned and properly put together we will feel assured of its good performance. It would no doubt be desirable to have the process described exactly in the order that everything should be done, and that the watch is taken apart But that is impossible, because, if given for one construction, another construction would require another entirely different order. And even for the one construction there would be so much rambling about, from one part to another and back again, that it would get the different items so mixed together that we could not find any particular one without reading over an entire article, or more, perhaps. Besides the order to be followed is largely a matter of choice or convenience. For these and other reasons it was thought better to give all the items and tests relating to each part together under that head, as far as practicable. In merely examining a watch to fix a price for repairs. it is not to be supposed, of course, that we test all the points, and in the manner described. But we can easily take a general look and discover the principal defects by taking wholly or partly to pieces, as may be needed, and applying such tests as will reveal anything very serious. All defects should be noted down, and the price set should be the full price of all the items. You will find enough more of smaller items to do when you get at work upon it, which will make your price cheap enough for the whole, without giving any discount at first—unless it makes a very large bill, when a reasonable discount can be deducted.

(714) *Setting Up.* A method will be given for setting up the ordinary bridge movement. For other constructions allowance must be made, but the general order or plan should be adhered to as closely as possible. First put the barrel arbor on the bridge and screw down the cover or bar, applying a little oil to the under side of the rachet wheel, and a trifle on the top. Turn the arbor with the key to see if the motion is free and smooth, while it is held firmly to its place. Put on the click and spring, and turn the arbor to see that the click works correctly every way. Put a little oil to the click center and a trifle on the lifting face of the point—being always careful not to put on enough to show on the polished surfaces. Then oil the arbor bearing in the bridge, and the upper shoulder, put on the barrel or its cover, as may be, and oil the barrel hole, also the upper hub, and screw or pin on the nut. Try the freedom of the upper hub between the nut and shoulder. Put in the main spring, see that both ends hook well, that it is of the right length, etc., as before directed. Oil well, putting some on the top of the spring, some also at the bottom, on the inner end and hook, and on the lower side of the nut. Spring in the cover in proper position (677), and oil the lower pivot hole. Hold the barrel in the fingers and wind the spring entirely up to find the number of turns the arbor has, and put on the stop works as just directed. In all these operations, and all others in handling cleaned pieces, use clean tissue paper, so that the skin shall not touch the gilding. If it does so accidentally, it should be immediately cleaned off. Now screw the main wheel bridge in place, and turn the arbor to see if the barrel is free in the plate, true in the flat, and correct in all the respects fully described before.

(715) Insert the center wheel and bridge, try the end-skake and freedom (664). Turn the barrel arbor very slowly two or three times around and observe the center wheel. If it moves with perfect freedom, no catching anywhere, true in the flat, not too near the barrel, or the bridge above it, see if the pivots are of the right length, etc., oil them and put in the center staff (which you had brought to fit the center pinion properly before cleaning), and cannon pinion; then see if the center pinion is yet perfectly free, etc. If the barrel can be taken out easily without disturbing the center wheel or bridge, it is customary to remove it for convenience of testing the remainder of the train. Put in the fourth and third wheels, screw on the third bridge, try the end shake, then the fourth bridge, and test end shake of fourth pinion. Now examine if center wheel clears the third bridge (665), and the depthing of center and third wheels in the third and fourth pinions. Then, with the peg wood in the center wheel, try the freedom of the train thus far, if the wheels are true, etc., (633). If they do not appear perfectly free, give the center wheel a push and see how long the train runs without stopping, and how it stops. Do this with both sides up to test the freedom of the pivots. If the train comes to rest slowly, and has no particular place or mode of stoping, it must be free and the escape wheel may be put in, end shake, truth and freedom tested, fourth wheel depthing examined, and the train again tried as before. When all is correct, replace the barrel and test by turning the arbor as described below.

(716) When the barrel cannot be removed without disturbing the center wheel or bridge it may be left in, and, after the third and fourth bridges are in place and tested as before, instead of seeing how long the train runs, turn the barrel arbor very slowly and watch if all the wheels are perfectly free, and jump forward as the click, passes each tooth of the rachet. Then put in the escape wheel and try in the same way, both sides up. If the barrel has no stop works on it can be left in, and the former test for the free train applied (715). It is of course understood that the different depthings were examined when taking apart, and corrected when deficient, till they would pass the test in section (634). But in putting together that test is not to be applied, as fine bits of the peg wood are liable to become detached and wedge in between the pivot and the sides of its hole, necessitating the taking off of the bridges and cleaning of the holes and pivots. When the pivot is closely fitted, a very little sliver will stop the watch; while if loose, there will be so much the more liability of pieces of the wood breaking off and sticking in. This trouble is more common than would be imagined. Although supposed to be correct, the depthings are examined in setting up the train to see that they are not disarranged by the bridges moving sideways. If the steady pins do not fill their holes they should be slightly spread apart, so that, together, they would hold the bridge fast in place without depending on the screw (628), if this is practicable. If not, adjust the bridge carefully to its proper position and screw it securely fast. The third bridge, however, must invariably be secured in position by its steady pins, as the screw alone would not make it secure (663).

(717) Next we put in the lever, test end shake (650), etc., (318); see if escape wheel teeth can touch the belly of the pallets (319), or up under the center of the fork, or under its tail or anchor, or anywhere that they ought not to, and that they act on the pallet jewels properly. Then, while perfectly free (the mainspring not being wound at all), we incline the plate a little to one side and the other to see if

the fork falls freely from one bank to the other (318). Do this with both sides up. If the lever is poised of course this test will not work, and we must depend on the "drop" test (650). Then press the centre wheel gently forward, and with the point of the tweezers or of the peg wood loosely in the fork of the lever, we try the depth of the lockings (326, 335, 457), the depth or pitching of the wheel and pallets (330); whether the wheel can escape freely (368), etc. In unlocking or moving the fork off the banking, the point follows or pushes the fork. But as soon as unlocking takes place the fork is urged forward by the wheel, and from that instant till the other bank is reached, the fork follows or pushes against the point, which is moved slowly and steadily across till the fork rests against the bank and the wheel is locked again. But if the depthing of the wheel and pallets is too shallow, when the wheel "drops," or the tooth leaves the pallet, instead of the fork still following the point on to the bank as above, it will fly back or *from* the bank, the other side of the lever notch, will then rest against the point, and the fork tends to return to its starting place, without locking. Of course, if the point is moved forward, it will force the fork against the bank and compel locking.

(718) But whether the fork would be so carried forward by the ruby pin in running, or would fail to lock, and cause stoppage or at least prevent a decent movement of the balance, depends on how much too scant the depthing is. This we can test as described in the last part of section (330). In applying this test it is necessary to follow closely the directions above given, and "press the center wheel forward *gently*," as too strong a pressure would make a perfect wheel and pallet action appear to be pitched too shallow. The excessive force would cause the fork to fly across and strike the bank so violently as to rebound therefrom and fail to lock, whereas it would have locked properly at a more moderate speed, such as it would have in the actual running of the watch. This rebounding will be more marked when the banking pins are rather small or elastic, or when they stand near the end of a long and slim fork. As the teeth are only intended to lap upon the pallets, 1½° to 2½° (334), a very slight recoil of the fork would carry the tooth off the locking face, even after it had locked properly. Should there be any failure to lock with a gentle pressure, and it locks when tested as described in the preceding section, either the escapement was not properly corrected before cleaning or it has become displaced since then.

(719) If the pallets and the fork were securely fastened together so that they have not moved on each other, then the bridge over the lever or over the escape wheel, or both, may stand differently, and should be moved nearer together. But if they stand so that they hold their arbors vertically they should not be moved, even if that would make the pitching of the wheel and pallet deeper, which it will seldom do to any extent unless the bridges are moved an unreasonable amount, owing to the acting parts being so near the stationary ends of the arbors. In this case—the bridges holding the arbors vertically—the shallow pitching must be the result of some change since the escapement was adjusted. The test in the beginning of section (330) should be applied, to discover if both pallets are too far from the wheel, or only one, and make the correction as there directed. If the workman has an angle meter it will be easy to ascertain if the pitching is too shallow, and the amount of the fault, by completing the test described in section (457) or as in section (460).

(720) We next oil the balance pivot holes and put on the balance and its bridge. If everything has been correctly adjusted before cleaning, and the bridge goes properly to its place, there should be little need for testing the fork-and-roller, safety and banking actions again. But if the bridge can vary its position sideways, we must of course see that it has been or shall be placed in the best one. Examine the end shake (294), see if the balance is horizontal and clears the plate, the escape wheel bridge, (whether that is under or beside the balance), projecting screws, etc., the center or third wheel, fourth pinion, the pallet arbor or screw, its own bridge, the ends of the regulator pins, the hair-spring stud, its pin, or the waste end of the hair-spring, the upper surface of the lever fork, or the pin fastening the pallets to it, dial post and its screw, etc., in any part of the balance end shake, and see that it has end shake enough. Lift the lever to its highest end shake and see if the horns can touch up under the roller table, etc. If the banks are pins or screws, see if they have got bent or turned (315, 429), or the guard point rubs on the edge of the roller table when the fork rests against the banks. The other functions of the escapement will not need examining again now, if they were properly tested and adjusted in taking the watch down, as directed in the detached lever escapement (313 to 472)—unless some accident has happened to it since.

Horology.

FROM this time the making of large clocks for public edifices was carried on very extensively over Europe; but it was not until the beginning of the sixteenth century that small clocks were made for apartments. The first we know of came from Florence, in 1518, as a present from Julio di Medici (afterwards Pope Clement the Seventh) to Francis the First of France. It was also in this same sixteenth century that horology was first applied to astronomical calculations by Purbach in 1500. In 1560, the Danish astronomer, Tycho-Brahe, the teacher of the great Kepler, set up in his magnificent observatory of Crapiesburg a clock which marked both the minutes and the seconds.

The invention of watches had preceded by a few years that of small clocks. Our ideas of a primitive watch are always associated with a turnip; but it was not until the seventeenth century, when the Scotchman, Graham, invented the cylindrical escapement, that watches assumed this respectable but inconvenient shape. At first they affected all sorts of fancy forms, such as those of acorns, olives, walnuts, and crosses. They cost fabulous sums of money, and were generally worn as pendants hanging by a gold chain from ladies' bracelets. Claude, wife of Francis the First, had one so small that it was set in a ring.

Popular tradition ascribes the invention of watches to Peter Hele of Nuremberg, in the year 1490. But then it is a notorious fact that King Robert of Scotland possessed one, so far back as the year 1310. The only way in which we can account for this discrepency is by the supposition that watches were originally invented by a Scotchman, but that the maker died suddenly without promulgating his secret. German watches were not introduced at the English court until 1597. The first seen in England was worn by the beauful Lady Arabella Stuart

It is to Hugens of Zulichem that the greatest, we might almost say the last, progress in the art of horology is due. But Hugens only caught up an idea that had first occurred to the great Galileo. Every one knows the story of the lamp suspended to the vault of the cathedral of Pisa, the oscillation of which caused the astronomer to reflect that the isochronal movements of pendulums might well be applied to the measuring of time. Galileo was only a boy when he stood watching the cathedral lamp swing; but many years after, that is in 1630, the thought came into his head again, and he drew up a plan on paper for the making of a pendulum clock. His invention went no further, however, and the honor of putting his theories into practice was reserved for Hugens, who, in 1657, forwarded to the State General of Holland the description of a timepiece, constructed on the new principles. Its perfection lay in the introduction of the pendulum and of the spiral mainspring The name of Hugens de serves to be remembered, for his pendulum clock is the most admirable and yet most simple machine that has ever been invented.

The invention of spring pocket watches, such as we now wear, is owing to the Englishman Hooke, it dates from 1658, and eighteen years after this, in the year 1676, the first repeating watch was made at Amsterdam. From this time until the present century, when chronometers and stop-watches were invented, the science of horology received no further developments; neither do we well see how it can receive any, unless some future Hele, or some futute Hugens discover a method of making clocks go by electricity without giving us the trouble of winding.

In these days it is a mooted point as to which is the best country in which to buy a watch or clock. In the last century it was universally admitted that the watches of Geneva were unrivalled, whilst the sculptured wooden-case clocks made in the Hartz mountains of Germany had the reputation of being the surest-goers, as well as the most valuable in point of artistic merit. Nowadays, however, Geneva, from wishing to make too cheaply, has somewhat lost her prestige for making well, and Swiss watches have come to be looked upon with some disfavor, especially in England. The battle seems to lie now by general consent, between France and Great Britain, our neighbors priding themselves upon the exquisite beauty of their ladies' watches, whilst we, on the contrary, carry off the palm for the soundness and finish of our men's watches.

But there is one branch of horology in which the French canno even attempt to compete with us, and that is in the making of chronometers. English chronometers are held incomparable the whole world over, and this is no wonder when we remember the severe test to which all official chronometers (that is those used in her Majesty's navy) are subjected before they are approved by the sign-manual of the Astronomer Royal. All naval chronometers have undergone a probationary stage of six months, a year, and in some cases two years at the Greenwich Observatory before receiving their liceat to go over the seas. During this time they are submitted to a whole series of scientific experiments, comprising all possible changes of temperature, ordeal by fire, and ordeal by water. So that it may well be said when one of them passes the examination, that the man who has made it deserves something better than the title of mechanic; he should take the rank as an artist, and a first-rate artist too.

In conclusion, we may remark that the Greenwich Observatory is often a deposit for other chronometers than those which are intended for the fleet. Conscientious makers send the chronometers they intend for the public to be tested there before offering them for sale; and we should advise anybody about to purchase one of these valuable timekeepers to insist on the Greenwich mark upon it, as he would the Hall mark if buying silver plate. It is well to be always on the safe side.

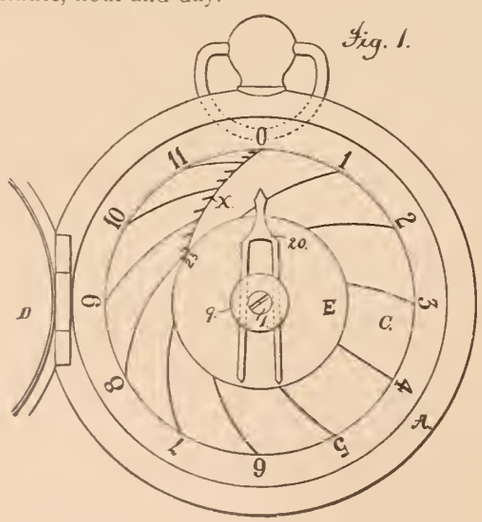
The American Pedometer.

This remarkable invention of Mr. Benjamin S. Church, the well-known Engineer of the Croton Aqueduct, has attracted considerable attention.

This instrument accurately measures the distance a person carrying it walks, showing the amount of daily exercise taken in and out of doors.

Its mechanism is a marvel of simplicity, and can be adjusted to any length of step. It is strong and durable, and the size of a small watch. Ladies, professional and business men, students, pedestrians, sportsmen, farmers, surveyors, and others will find it very useful. A table accompanies each pedometer, giving the number of steps taken in a mile, minute, hour and day.

Fig. 1.



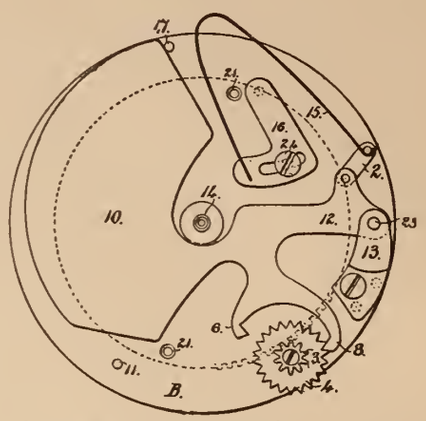
The distinctive features of this instrument are:

1st. A weighted lever, 10–12, suspended horizontally by a link, 2, hung on a spring, 15, which can be adjusted to the proper degree of tension by arm, 16, and clasped by set screw, 24.

2d. The star-wheel, 4, fixed to the pinion, 3, which is accellerated by an anchor and pullets, 6–8, attached to the suspended hammer, which vibrates at any step, giving a regular and positive motion that cannot be accelerated beyond the regular beating of the weighted lever.

3d. A rapid and simple division of motion accomplished by two wheels, 18–19, of the same diameter, revolving on the same post, 14, and gearing into the same pinion, 3, one wheel having one more

Fig. 2.



tooth than the other. At every revolution of these two wheels, it follows that the wheel, 19, with the lesser number of teeth, which carries the hand, will advance one tooth beyond its mate, 18, which

Fig. 3.

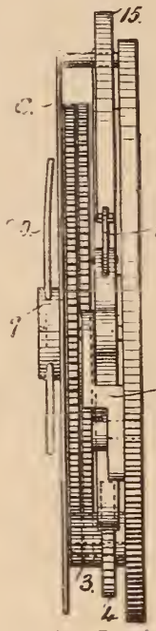


Fig. 4.

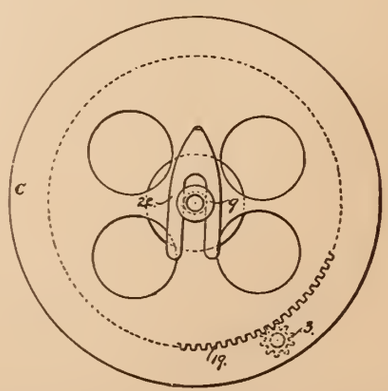


Fig. 5.



carries the dial, E; the hand, 20, and dial E, therefore revolve together, the hand moving by slow degrees faster than the dial, to indicate the distance walked.

Fig. 6.



4th. The varying scale, C, on a dial, E, combined with a hand, 20, that can be pushed in and out from the center, so that its point can be set on a scale of inches, X, representing the length of step—the rest of the machinery having the same movement, whether the step be long or short.

Legal Regulations for the Standard of Gold and Silver Ware in the Different Countries of the World.

BY EDWIN W. STREETER.

In Holland the law of September 18th, 1852, determined the working of precious metal in each standard. The guaranteed regulations of the degrees of the standards are as follows:

Gold Wa e.	Silver Ware.
1. $\frac{916}{1000}$	1. $\frac{934}{1000}$
2. $\frac{833}{1000}$	2. $\frac{833}{1000}$
3. $\frac{750}{1000}$	
4. $\frac{583}{1000}$	

Precious metal ware of other standards bears a stamp in token of the payment of the duty required by the State. Moreover every manufacturer is compelled to place his own stamp on all completed articles. Gold ware is subject to a duty of 12 florins per hectogramme, and silver ware of 60 cents per hectogramme.

In the kingdom of Italy, with the exception of Tuscany, the law is that the minimum standard of silver ware shall be $\frac{800}{1000}$, and of gold ware $\frac{500}{1000}$. Before the formation of the kingdom of Italy there were different laws for every State, and different standards.

It is evident that the legal restrictions in Italy have operated neither to the advantage of the industry nor to the benefit of the public.

In Austria the legal regulations of the standard of precious meta ware were not the same in all parts of the kingdom.

With relation to this question the crown lands were separated into three distinct groups, viz;

1st. Deutsch-Sclavischen Landern (Sclavonia).

2d. The Lombardo-Venetian kingdom.

3d. The Hungarian division, including Dalmatia and Cracow.

The differences were as follows:

The Hungarian division had no laws or restrictions for the standards of gold and silver ware.

In the Lombardo-Venetian kingdom, according to the Napoleonic law of 1810, all gold and silver ware (without exception) was subject to control; while in the Deutsch-Sclavischen territory, according to a law of 1824, gold ware of less weight than 4 ducats was not subject to stamping.

The following standards were observed in the Lombardo-Venetian division:

Gold ware: 22 carats, 21 carats, 20 carats, and 18 carats.

Silver: 15 ounces and 12 ounces.

In Dutch-Sclavischen territory:

Gold ware: 7 carats 10 grains, 13 carats 1 grain, and 18 carats 5 grains.

The necessity for uniformity of regulations was so evident that in 1835 a discussion was opened, and the issue of a circular explaining the state of the standards determined on, but without any practical results.

The discrepancies between the different groups were so great and led to such embarrassing results, that the necessity for legislative enactment was acknowledged by the State, and gave rise to the scheme of provisional regulations for stamping the standards of gold and silver ware in 1852. But this also fared the same fate as other endeavors; it never became law.

The first real step towards improvement was caused by the conference of delegates from the Zoll Verein, who, in 1856, devoted ten sittings to the question of "unanimity in the control of the standards of gold and silver ware."

Russia.—1. To insure the real worth of circulating gold and silver, whether in bars or as ware, it must have the legal sign or stamp.

2. Officers of the testing office are not allowed to carry on any trade connected with the office in which they are employed; nor either in their own name or in that of any other, to trade in gold and silver; nor to have any dealings with master manufacturers, jewelers or gold and silversmiths.

71. Standard for gold ware and bars:

$\frac{56}{96}$ $\frac{72}{96}$ $\frac{32}{96}$ $\frac{91}{96}$

Gold used for soldering is required to be not lower than $\frac{36}{84}$; silver for the same purpose must not be below $\frac{64}{96}$.

Standards for silver and for gold plated:

$\frac{84}{96}$ $\frac{88}{96}$ $\frac{91}{96}$

72. As alloy for gold only red copper or silver may be used; and for silver only red copper.

76. Russian coins, native gold, gold-sand and unstamped bars are not allowed to be melted together.

107. Trade in gold and silver of every kind, and in bars, may be conducted in open magazines and shops, either exclusively or in conjunction with other articles. But it is strictly forbidden to sell them in little huts or on stalls in the market-place.

114. All who desire to work in the gold trade, in whatever branch it may be, must obtain permission; and this permission must be renewed in the December of every year.

120. No gold and silver worker can change his place of occupation without notice and without permission.

Switzerland.—Canton Basle.—1. All gold and silver manufacturers must be most accurate in ascertaining and proving that the standard for gold ware is eighteen carats, and for silver 12 oz. 9 grs.

2. All finished articles must have the name of the goldsmith stamped on them.

3. Every master whose name is stamped on the article is answerable for its standard, whether it was made here or in any other land.

There is not a large industry of gold and silver ware in Basle, most of the ware being imported from Paris and Geneva.

Canton Zurich.—Standard for gold, 18 carats; for silver, 13 oz. or 6 deniers.

There are three manufactories for gold and silver ware in this Canton, viz., at Zurich, Winterthur and Elgg.

Canton Soleure.—No real laws existing.

Canton Glarus.—No new law has been enacted since 1761, when the standard was fixed for silver at 12 oz., but nothing said of gold.

5. Gold and silver ware sent out without the name of the manufacturer and the arms of the Canton will be confiscated to the State, and a fine of sixteen francs imposed upon the manufacturer.

Wardens are appointed to inspect the several workshops and the yearly markets, and to report to the President of the Canton.

Pays de Vaud.—Up to 1848 there was no law regulating the standard of gold and silver ware, but in December of that year it was decreed:

1. All precious metal ware manufactured or sold in the Pays de Vaud must have the correct standard.

12. Every article must be stamped with the name of the manufacturer and the degrre of the standard.

14. The Chamber of Commerce is appointed to watch over the standard of the precious metals in the Pays de Vaud.

15. Every gold or silversmith must deposit his stamp at the Chamber of Commerce, and this Chamber must see that every manufacturer has a different stamp.

16. Should the manufacturer die, or his business given up, his stamp is broken up at the Chamber of Commerce.

24. Strange merchants buying precious metal ware at the market of this Canton must give notice to the Chamber of Commerce, in order that the ware may be tested.

25. When the testers are about to inspect the ware they have to take an oath before a Commissioner of the Chamber of Commerce.

In November, 1873, permission was granted for the manufacture of precious metal ware at any standard the manufacturer may be pleased to adopt.

If a wrong stamp be placed on the ware a fine is inflicted of from 30 to 500 francs, or imprisonment from 29 to 180 days.

Canton Neufchatel.—The oldest laws in this Canton concerning the precious metal industry date from September, 1754.

Manufacturers are forbidden to make gold ware under 18 carats, and silver ware under 13 ounces.

Of confiscated goods a third goes to the King of Prussia, a third to the officers, and a third to the informer who discovered the fraud.

Canton Geneva.—The principal industry is watch-making and bijouterie.

The remaining Cantons have no laws relating to gold and silver ware.

In Sweeden there are three standards for gold ware, viz.: ducat-gold, pistolen-gold and crown-gold; or 23 carat 5 gr., 20 carat 4 gr., and 18 carat 4 gr.

All goods, except the very small, must be stamped.

Norway.—No gold ware can be sold that has not a standard of from 18 to 14 carats at the lowest, and all must be stamped by the manufacturer and bear the standard stamp.

Prussia.—No restrictive laws in force.

Bavaria.—Minimum standard of gold, $\frac{583}{1000}$; silver, $\frac{800}{1000}$.

Saxony.—No new laws, and the old ones not enforced.

Hesse.—Since 1829 all gold and silversmiths are compelled to have their ware stamped with the standard, the initials of the manufacturer, and the arms of the Duchy.

Mecklenburg-Strelitz.—No new laws since 1572, and those not enforced.

Oldenburg.—A law of 1760 declares that the standard for silver is to be 12 ox.; and that, together with the name of the manufacturer, must be stamped on it.

Brunswick.—Name and standard must be marked on goods, on pain of 20 thalers fine or imprisonment.

Hamburg—No silver can have a lower standard than 11 ox. 12 grains. All ware of a higer standard to be stamped with the maker's name and the standard. There is no law in Hamburg for gold ware.

Bremen.—Never had any restrictive laws for precious metal trade.

Lubeck.—Previous to 1872 no silver ware could be made in this town under a standard of 12 oz. to the mark. Since that period, however, permission has been given to manufacture of any standard All goods to be stamped at the cost of the manufacturer. In other lands and towns of Europe no restrictive laws exist.

America.—There is no special statutes concerning the standard of articles made from the precious metals, either in the United States or in the States of South America.

Egypt.—Laws like those of Turkey.

Morocco.—Laws like those of France.

China.—Nothing but *pure gold* is allowed to be worked here, and any Chinaman found alloying the precious metal in order to deceive the purchaser, is *decapitated.*

Persia.—There are no restrictions on the manufacture of precious metal ware.

In Germany a common legislative regulation of the standard of gold and silver ware has already been adverted to. The transactions most fresh in our remembrance, however, are those of the year 1856, which we have sketched above, and which were intended to lead to a regulation of the standard of gold and silver ware in association with Austria upon the principle proposed by that State.

Notwithstanding this no common legislation resulted, but on the 21st of June, 1869, a trade order was issued which put an end to the existence of the guild by which the limitations of the standard of gold and silver had been defined. However, in certain towns in German (Berlin for example), may still be found testers appointed and sworn by the Goldsmiths' Corporation; nor is the influence of the guild by any means extinguished, since in Berlin (where silver only is stamped, and that simply in a facultative manner), a tester, appointed by the guild, marks the standard only upon such articles as are of at least 12 oz. quality.

These remnants of old rights, the exercise of which is slowly continued like an ineradicable disease, still give character to the laws upon the precious metal trade in such towns as from the nature of their industry stand prominently forward in this department.

Silver ware of 11 oz. standard is therefore chiefly manufactured in Schleswig, Holstein, Posen and Silesia; of 12 oz. in the northern and eastern parts of Germany, and of 13 oz. standard in the southern and western parts.

In the meantime "the competition as to price and the abuses resulting from loose laws of protection, which are evaded or transgressed with impunity, have lowered the standards of silver by admitting an excess of alloy, which, if not corrected, will render the name of 'German Silver' synonymous abroad with adulterated and spurious metal."

These are the words of a petition of October 4th, 1872, addressed by 154 silver manufacturers of North and South Germany to the Confederation and Diet, to which undoubtedly belongs the credit of having called attention afresh to the common regulation of the standard of gold and silver ware in the German Empire. There, however, the credit of the petition ends, for it seeks to lay restrictions upon the silver trade which are in open opposition to the principles of national freedom,

The proposed law subjoined to this petition runs as follows:

1. From the 1st January, 1874, silver articles may not be manufactured in the German Empire, or imported from abroad, which have a lower standard than that of the weight of 800 in 1,000 parts. Every other protective enactment, except that hitherto conceded to the mint, is repealed.

2. The standard is to be indicated by a stamp, viz., an imperial crown with an eagle or similar device, and the number 800 placed against it. This stamp to be manufactured in Berlin and to be issued by the local authorities on the expenses being defrayed by the manufacturer or seller. All silver goods to be impressed with the stamp. Should these have a standard in excess of 800, it is to be expressed in decimals beside the imperial stamp.

3. Silver ware of lower standard, in hand at the time of the introduction of this law, may be sold out, but they are not to be furnished with the imperial stamp.

4. Every seller of silver ware is to be obliged to place his trade mark beside the imperial stamp, and undertakes in so doing to guarantee to the buyer the right standard. If the seller be not himself the manufacturer, he can make the latter responsible should an investigation prove a defective standard. The last buyer, however, has the right to claim against the person who sold to him. If a seller will not undertake this responsibility he may not stamp his own trade-mark; but in that event he must indicate that of the working silversmith or manufacturer, so that the buyer may always enjoy a personal security in addition to that implied in the imperial stamp.

5. In doubtful cases assayers appointed by the German Mint are commissioned to investigate the silver goods submitted to them, in conformity with the process pursued in the coinage. Should the investigation disclose an inferior standard, the seller or the manufacturer (as the case may be) must pay the penalty imposed by law.

The fact of so large a number as 154 men in the trade expressing themselves in favor of this law may induce others to favor it also. We are not unaware that in all national reforms, the advantages of which were patent from the first, it has always been those most concerned who have been slowest to perceive them.

An imposing number of silver manufacturers send up a petition, ostensibly for reform, but it really proves to be nothing better than a generalization of already existing restraints, or an advocacy of laws to limit the freedom of manufacture. But that this restriction is adverse to the manufacture may be illustrated by the success which has attend the repeal of the laws on gold and silver in the case of Geneva and other States; the benefit extending beyond the special sphere of the trade to the wider compass of the whole nation.

The latest hair ornaments are marguerites in diamonds, which are set upon quivering golden stems, and may be used either separate or a number of them together. In smaller sizes they are employed to make dog collars upon black velvet, which are tied closely around the throat.

Precious Stones and Gems.

BY EDWIN W. STREETER.

NO precious stone is more interesting to the general reader than this. In old Arabic it was termed "Sappeer," to scratch; and in Syriac and Hebrew, by verbs cognate and of similar signification. The Chaldean characters of the alphabet and ancient books were called by the same "word," probably because of the great hardness of the sapphire, and the ease with which stones or rocks could be engraven by it. This gem is known to almost all nations by the one name sapphire. It is a corundum, and is found most frequently in secondary deposits, loose in sand, or in debris, with other precious stones. Occasionally, however, it is found embedded in primary deposits, in granite, syenite, Basalt, Gneis, Talc, and Hornblende, strata of specular iron, and magnetic iron-stone.

The type of its crystalization is the six-sided prism and the hexagonal pyramid. Its specific gravity is 3·9 to 4·2. In color it is a beautiful blue, like to that of the blossom of the little weed called the "corn-flower," and the more velvety its appearance the greater the value of the stone. The Oriental sapphire retains its exquisite color by gas-light, while that of less value becomes black, or like to an amethyst in color. Pliny knew this gem well, and speaking of its color compares it to the same flower as we do. It can now be imitated, but the ancients had no idea of the possibility of such a thing; and yet the dark-blue glass of the antique vase, with its dazzling white bas relief, in the British Museum, is world-renowed for its color and exquisite beauty. No doubt the color of the sapphire depends upon a small *ingredient* of chrome. Strange to say, up to quite modern times it was regarded as a medicine, and very extraordinary powers were attributed to it. It was dedicated by the Greeks to Apollo, because, when consulting his oracle, they thought that the possession of this gem, from its heavenly nature, would secure them an early and favorable answer.

In consequence of its hardness, its beautiful color, and its bright, vivid lustre, it is one of the most prized as well as one of the most fashionable of gems. It will always be an article of luxury from its comparatively high price.

The ancients knew and made use of the sapphire, but rarely for outward adornment, possibly because of the difficulty of manipulating so hard a stone. For personal ornaments it receives the form of the brilliant, which shows to best advantage the lustre of the stone.

Sapphires were originally obtained from Arabia and Persia; but now the finest stones are imported from the kingdom of Burmah. The same laws are in force regarding the finding of sapphires, as noticed in the chapter on rubies. In Ceylon sapphires are not rare; they are found in the debris of the mountains. In North America sapphires are found in rhomboid crystals, or six-sided prisms, of a beautiful blue, in combination with hornblende, glimmer, felspar, iron-pyrites, talc, and in granularlimestone; this is specially the case in Newton, New Jersey. In South Australia (Ballarat, in Victoria), blue and white sapphire are found so worn away that no trace of crystallization is left. Sapphires are also obtained from the clefts of the hanging rocks on the pearl rivers in New South Wales. Sapphires are found in parts of Europe, on the tops of the Iser Mountains in Bohemia. The river Iser having a very rapid current carries with it, in the soil, sapphires and other precious stones, and often deposits them on its shores, far away from their original home. In the Sieben-Gebirge small sapphires are found with gold in the sand. In Saxony they are imbedded in alluvium; specially is it so in Saxon-Switzerland.

Among the celebrated sapphires is that which was seen by the English ambassador, who was sent to Ava. It was said to be 651 carats in weight, of a beautiful blue and without a flaw. In the collection of minerals in the Jardin des Plantes, in Paris, is one of the most beautiful blue sapphires, weighing 132$\frac{1}{16}$ carats, without spot or fault. This stone was originally found in Bengal by a poor man; it subsequently came into the possession of the House of Rospoli, in Rome, who, in their turn, left it to a German Prince, who sold it to the French jewel merchant, Perret, for $170,000 francs, a sum much less than its real value.

Notwithstanding the extreme hardness of the sapphire, there are some beautifully engraved specimens in existence. In the Cabinet of Strozzi, in Rome, is a sapphire, a masterpiece of art, with the profile of Hercules engraven on it by Cneius. A very remarkable and famous sapphire, belonging to the Marchese Rinuccini, weighing fifty-three carats, has a representation of a hunting scene engraven on it, with the inscription Constantius Aug. Among a number of old family jewels recently in my possession, I found a sapphire beautifully engraved with the crest and arms of Cardinal Wolsey.

The value of these stones is very much determined by special circumstances, and like the diamond, its color, purity and size are taken into consideration when fixing the sum to be paid. Fine sapphires under the carat in weight, if English cut, vary from £4 to £12; if foreign cut, £2 to £5; those of a carat weight, £12 to £25. Sapphires do not, like the ruby, rise in price as they increase in size.

The Oriental sapphire is the most highly valued, and a perfect stone weighing about three carats, is even more costly than a diamond of like weight and similar quality. Those imperfections which appear at times in the sapphire, and which lessen its value, are clouds, milky half-opaque spots, white glassy stripes, rents, knots, a congregating of colors at one spot, and silky-looking flakes on the table of the stone. Not only are other stones of like order sold for the sapphire, but even glass (technically called flux).

Varieties of "doublet," (that is counterfeit stones composed of two pieces of crystal, with a color between them, so that they have the same appearance as if the whole substance of the crystal were covered), are passed not unfrequently for sapphires. They may be distinguished from the genuine stone partly by their color, but more especially by a careful examination of the girdle, when, should the sapphire have been joined to an inferior stone, the attempted deception will be detected.

Opinions differ much as to the length of time the true emerald has been known and valued; yet it is evident that it was known to the ancients, for we ourselves have seen ornaments made of emeralds which have been excavated from Pompeii and Herculaneum. Similar ornaments have been found in the ruins of old Rome, and even on the Egyptian mummies. Pliny also alludes to some old emerald mines on the Arabian Sea, which Caillaud discovered when sent by the Pasha of Egypt on an exploring mission. He found many of the caves or mines so large that 400 men could work together in them, and that they had been used long before was clear, as he there saw ropes, levers, lamps, tools of various kinds and many vessels. Pliny declares that the emerald stood very high in the estimation of the ancients.

We read also of Nero and Domitian using emeralds as ornaments for their dress. Democritus of Thrace was famous for the art of imitating the emerald. Seneca tells us that Democritus could put the fire and color of an emerald into a common pebble.

Isidorus, Bishop of Seville, (630 A. D.), says of the emerald "that it surpasses in greenness all green stones, and even the leaves of plants, and that it imparts to the air around it a green shimmer; that its color is most soothing to the eyes of those engaged in cutting and polishing the stone."

Psellos, in the 11th century, says of the emerald, "that it is leek-green, playing easily into gold and blue, and that it has power, when mixed with water, to heal leprosy and other diseases."

In the middle ages it was much used to ornament church treasures, and in the tiara of the Popes there was an emerald an inch long and one-and-a-quarter thick.

After the discovery of Peru, emeralds became less rare, and jewelers and lapidaries much preferred those from Peru; hence the most

beautiful of emeralds are always called Peruvian emeralds. Joseph D'Acosta, who himself visited the emerald mines of New Granada and Peru, said that at first these stones came to Europe in such numbers that on the ship in which he returned from America to Spain in 1857, were two chests, each containing one cwt. of emeralds. Most of the emeralds now come from Santa-Fe and the valley of Tunka, between the mountains of New Granada and Popagan.

The Ural and Altai mountains have of late years furnished true emeralds of the finest quality. The first emerald was found accidentally by a charcoal burner, in 1830, at the root of a tree on the east side of the Ural, in the district of Perni. This was at once followed up by a regular working of the bed, which yielded in the first year several good emeralds, one of the extraordinary size of 101¼ carats; but unfortunately the yield gradually decreased.

Those found in Salsburg, Austria, are dark-green six-sided prisms, often covered with glimmer, and not perfectly transparent.

It is doubtful whether any emerald mines ever existed in India. Those that are imported from that country are never in the rough but cut in an unfinished style by the Indian lapidaries. On arriving in Europe it is always necessary to re-cut them, so as to develop their full beauty by perfect workmanship. It is very difficult to say whence they are obtained, as they are of quite a different quality from those found in South America.

In the kingdom of Burmah, near to Ava, they are found in the sands or beds of small rivers, with pure gold and spinel. The Sultan of Oude presented our queen with a Burmese emerald as large as a moderate sized hen's egg.

There are some valuable beds of emeralds and topaz on the Chinese borders of Sibeaia.

The Egyptian emeralds have always held high rank in consequence of their richness of color. According to Pliny the celebrated mines in former times were in the rocks round about coptos, and the stones were admired for their brilliant sheen. Mahommed Ben Mantur (13th century) describes the emerald mines as being on the borders of the land of the negroes, and yet belonging to the kingdom of Egypt; the stones found here being dug out of talc and also red earth. De Laet thinks that the same region supplied emeralds as late as the 17th century.

The mines of which we know most are in the mountains of the Sahara (the beds being of mica-slate), and the bed of the river Harrach in Algiers where it joins the river Qued Bouman. In the latter emerald crystals have been found in white lamellated lime, which probably belonged to the chalk mountains. Large emeralds have been found-in the debris of Dolomite mountains.

One of the most celebrated emerald mines of the Tunka Valley is that of Muzo, 5° 39′ 50″ N. latitude, and 76° 45′ W. longitude (from Paris), N. N. W. of Bogata. It was discovered by Lanchero in 1555, but the Spaniards did not commence working it until 1568. It is now worked by a company who pay an annual rent for it to the government and employ 120 workmen. It has the form of a tunnel of about 100 yards deep, with very inclined walls. On the summit of the mountains and quite near to the mouth of the mine are large lakes whose waters are shut off by means of water-gates, which can be easily shifted when the laborers require the water. When the waters are freed they rush with great rapidity down the walls of the mine, and on reaching the bottom of it they are conducted by means of an underground canal through the mountains into a basin. The matrix of the emerald is a bituminous lime, rich in carbon, deposited on old red sandstone and clay slate. To obtain the emeralds the workmen begin by cutting steps on the inclined walls of the mine in order to make firm resting places for their feet. The overseer places the men at certain distances from each other to cut out a wide step with the help of pickaxes. The loosened stones fall by their own weight to the bottom of the mine. When this begins to fill a sign is given to let the waters loose, which rush down with great vehemence, carrying the fragments of rock with them through the mountain into the basin. This operation is repeated until the horizontal beds are exposed in which the emeralds are found. The emeralds are sometimes accompanied by beautiful crystals of iron pyrites, and now and then by parasite crystals. An emerald is not unfrequently found in fragments, which, when placed together, form one beautiful crystal. It has been supposed that in the moment of formation the stone became divided, and continued, when separated, its crystalization. Another remarkable cir cumstance is that the emeralds break shortly after being separated from the matrix. This is sometimes prevented by a little foresight, viz., by placing the stones into a vessel for some days and protecting them from the rays of the sun.

The emerald is found cropping up out of the earth in low prisms or columns, without stripes and without any inclination to the cylindrical form. It is sometimes, though not often, found in pebbles or grains. The color varies from what is called emerald-green to grass-green, and greenish-white. Subjected to the Dichroscope, it shows clearly emerald-green and sea-green. The variety of opinion as to the source of the beautiful color of the emerald is very interesting. According to some authorities it is said to owe its beauty to the chrome which it contains. On the other hand Levy, who analyzed with great care the emeralds from the Muzo mines of New Granada, found that they contained an organic matter, a simple combination of carburet of hydrogen and that the intensity of the color depended upon the amount of this organic matter contained in the emerald. Of protoxide of chromium he found but .01 per cent. Blum, experimenting upon the color of the emerald, exposed this stone for four minutes to an intense heat, and then threw it into the water, the consequence of which was that it fell into several pieces, some of which were of a black and others of a greenish tint. The color of an emerald loses somewhat of its intensity by long use, in consequence of the softness of the stone.

According to Mohs its hardness varies from 7·3 to 8; the specific gravity 2·67 to 2·73.

Perhaps there is no stone which suffers more than the emerald from inequality of structure, color and transparency, clouds and spots.

Fashion greatly influences the value of the emerald. When retained to enhance the price it yields to the potent attraction of other first-class gems and the demand subsides. When freely admitted into the market the taste often revives, as fashion springs not infrequently from the exhibition of color under favorable circumstances. The sapphire has now supplanted the emerald in general estimation.

Pliny gives the following anecdote as an illustration of the fire and lustre of the emerald: "In the Island of Cyprus stands the sepulchre of King Hermias, on which is a lion formed of marble, but with eyes of emeralds, which shone so brightly on the surrounding sea that the tunny fish were frightened away; the fishermen, having long observed this phenomenon, resolve to remove this disadvan tage and so have replaced the emeralds by other stones which have not this property of sparkling brightness." What was due to the shadow of the figure was not considered.

In the Manta Valley the natives are said to have worshipped an emerald of the size of an ostrich's egg, under the title of Goddess of Emeralds. The priests permitted her to be seen by the worshippers only on high festivals, when the poor people were expected to bring emeralds as offerings to their goddess; thus they became possessed of a large collection of these precious stones which fell into the hands of the Spaniards after the discovery of Peru. Don Alvarado and his followers, who evidently knew nothing of the brittle character of the emerald, had them broken to pieces, firmly believing that had they been genuine stones they would have resisted the power of the hammer.

Table Forks.

We are often disposed to sneer at the Chinese mode of eating their food with chopsticks, and fancy they must make very dirty work at their meals, yet they are cleanly compared wilh the habits of our ancestors of two or three centuries since. At that time, even in the best society, forks were unknown, except among the Italians, who appear to have had them in general uso considerably earlier than any other European nation, and are believed to be the inventors, or rather the originators, of the custom of using the fork at the table. Forks, howevor, had long been used for raising meats out of pots or cooking vessels by the Greeks and Romans, and the use of forks for lifting the meat from the seething pots is recorded in the Bible. The Egyptian priests, also, in presenting offerings to the gods, used forks made of bronze, two of which, dug up at Sakkarah, are in the Abbott collection. None of these people, however, although familiar with the use of the fork in this manner, had any idea of using the fork at table. The mode of serving meat varys somewhat in different nations. In some countries the head of the house took the joint in one hand, and, with a knife held in the other, severed the meat into suitable pieces for each person. In other cases the joint was passed from hand to hand, each person cutting off enough for himself with his own knife, and then passing it to his neighbor, each cutting off such part as suited him. The portion thus cut off was afterward divided into smaller pieces suitable for eating, and conveyed to the mouth by the fingers of the hand unoccupied by the knife.

In many parts of Spain, to this day, table forks are unknown articles. In many taverns in other parts of Europe, knives are not placed on the table, because it is expected that each traveler is provided with his own, but as few persons will now eat without forks, landlords are obliged to furnish those, together with plates and spoons. It is curious that although the use of forks has not yet spread all over Europe, yet the savage Fejee Islanders have long had table forks in use. At a time when almost all of Northern Europe was destitute of the article, these people, the most cruel and most ingenious of all the natives of Polynesia, used forks in conveying to their mouths dainty morsels of *puakabalava* (long pig), as they called cooked man.

None of the sovereigns of England had forks till the reign of Henry VIII., all, high and low, using their fingers. Queen Eliza had several forks presented to her, and although she was seen to use them on state occasions, it is doubted if she used them ordinarily.

Voltaire states that table forks were first used by the Lombards in the fourteenth century, and Martin says that they were in common use in Italy in the fifteenth century. Coryat, in his "Crudites," published in 1611, states that he observed a custom in all Italian cities through which he passed that he had seen nowhere else in all his travels. "The Italians, and also most strangers that are cormorant in Italy, doe alwaies at their meales vse a little fork when they cut their meat." Heylin, in his "Cosmograph" (1662), says: "The use of silver forks, which is by some of our spruce gallants taken up of late, came from China into Italy, and thence to England." Another writer states that at the period of the revolution (1688) few English noblemen had more than a dozen forks of silver, along with a few of iron or steel. But after this steel forks became an article of manufacture at Sheffield, and they came into general use, having, however, only two prongs, and it was only in later times that the three pronged kind were used. These were originally forged and filed to shape slowly by hand, but in the present mode of manufacture, after the tang, shoulder, and shank are formed, a portion is flattened for the prongs, which is then struck up into form by a swage drop, leaving only a thin film between the tines, which is cleared away by the file. These processes are followed by hardening, tempering, grinding and polishing. and securing the handles.

Although silver forks have long been in use to some extent, it was not until of late years that their use became in anywise common, as very few, even among the wealthy, used them until about fifty or sixty years ago, and the steel ones are still very largely used among the poor.

Many patents have been granted of late years on forks of various kinds, over a dozen being for means of combining the "finger-guard" on carving forks with a "rest," so that the raising of the former will lower the latter. In addition to these we find many patents granted for various improvements relating to ordinary dinner forks. One granted to F. C. Beach, December 5, 1865, shows a fork provided with a simple device for sharpening a knife; and the same gentleman, in connection with A. C. Klancke, obtained another patent September 4, 1866, for making the handles of knives and forks hollow, so as to form a pepper box, the sprinkler being provided with a valve so as to shut off the supply when not needed. C. A. Durgin's patent of May 8, 1866, shows a fork having the two inner tines dropped below the outer ones, so as to make a kind of spoon for taking up peas or other small articles. J. S. Jennings' patent of September 11, 1856, shows a fork having pivoted to it a swinging knife, the two being so connected as to be readily used by a one-handed person, as the swinging knife may be readily operated by a single finger of the hand holding the fork. A combined knife, spoon and fork in one instrument is shown in the patent of N. Ames, September 17, 1871, a spoon being formed on the end of the back of the knife, and the point of the spoon terminating in short tines. The patent of S. W. Francis, February 3, 1874, and C. Reese, April 23, 1878, both show spoons having cutting edges at the sides of the bowl and tines at the point, thus combining a spoon, knife and fork in one implement. A very elegant fork was patented by J. Draper, February 18, 1873, which was designed to be used in eating fruit, and is provided with a small bowl at the junction of the tines to catch the juice of the fruit. Another peculiar fork is shown in F. M. Dixon's patent of February 13, 1877, designed to be used for holding green corn in the ear, and has a long central tine to pierce the cob, and a short one on each side intended to enter the cob just sufficient to prevent its turning.

The Nickel Platers.

ONE of the most important law cases decided in our courts for a long time past is that of the United Nickel Company vs. all manufacturers of nickel goods, with few exceptions. Judge Blatchford's decision, given a few days ago, and which was the signal for the issue of numerous injunctions, is so sweeping in its character and so far searching that the effects may almost be described as a panic. The case has been pending for six or seven years, to prevent the alleged infringement of Dr. Adams' patent for an improvement in the electro deposition of nickel, and if sustained is regarded as equivalent to the destruction of the trade. The defendants, however, we learn by inquiry of counsel, will aapeal the case to the Supreme Court of the United States, retaining for this purpose Senator Conkling. It is understood that the latter regards this decision as failing to cover one of the essential points, so that if there is in use any solution, or if any is hereafter discovered which is not described in Blatchford's decision, then manufacturers can go on without any infringement. But as the matter now stands the defendants are enjoined from producing any more goods, and in addition they are called upon to pay back royalty at the rate of $4 per day for every 100-gallon tank in their establishment. It is remarked in the trade that the enforcement of such a decision will exterminate a large number of the smaller concerns, and that even the largest will have a struggle to pay the royalty demanded, except in the busy season. In answer to the question whether the victors in this suit will not find it more advantageous to manufacture exclusively all nickel goods rather than collect royalties, the remark is made that the country is too large, and the demands of the trade on too large a scale to make a monopoly possible. It is also claimed that there are in use new processes and new anodes not included in what is known as the Adams patent.

Trade Gossip.

R. C. Fisk, of Big Rapids, has gone to Colorado.

The thief who robbed Thrall's jewelry store, has been sent up for five years.

R. Mueller, formerly of Muskegan, Mich., has removed to Milwaukee, Wis.

The "Laurel" spoon is the latest design at the Meriden Company's show rooms.

French, the auctioneer, is disposing of L. A. Benton's stock of jewelry, at auction, in Cleveland.

St. Paul jewelers are supplied with the correct time from the Carrolton College Observatory, transmitted direct to their stores.

Messrs. Simpson, Hall, Miller & Co. have leased the premises, 36 E. 14th street (Union Square), which they will occupy about Feb. 1st.

Ben Landen is engaged upon a crayon likeness of the late Mr. Jaques Guedin, which is intended for the room of the Jewelers' Association.

The American Watch Tool Company have been awarded a silver medal for their lathes, at the Mechanics' Fair, Boston, Mass. This is the highest award in their class.

Hart & Sloan, of Newark, have purchased a large portion of the machinery and tools that formerly belonged to the United States Watch Company, at Marion, N. J.

One Williams, alias Livingston, a notorious shoplifter, who has for years been preying upon the retail jewelers of this city, had an interview with Judge Sutherland, at the Court of General Sessions, which resulted in his being sent to the State's prison for five years.

We learn that Mr. Louis Audemars has received the grand cross of the Legion of Honor, in addition to the gold medal awarded to him at the Paris Exposition. This distinction has never before been conferred upon any horologist, and we heartily congratulate Mr. Audemars upon the honor which he so justly merits.

The old established firm of Ve. J. Magnin, Guedin & Co., now occupy their new building, at 29 Union Square, corner of W. 16th street, which they have fitted up in keeping with the artistic character of their goods. The store, which is one of the finest in the city, has been stocked with a choice selection of jewelry, watches, bronzes, clocks and fancy goods of every description, worthy of the reputation of this distinguished house.

Mr. Philo W. Schofield, a traveler for Messrs. Thomas W. Adams & Co., of New York, checked his trunk from Memphis to Vicksburg, but on arrival at his destination could not find it. He promptly telegraphed to the Jewelers' Protective Association, who at once sent Pinkerton's agency to work. The trunk was traced, through their exertions, and after ten days' delay was restored by the railway company, through whose mistake the trunk had gone astray.

Sackett, Davis & Co., one of the oldest manufacturing jewelry houses in Providence, R. I., has made a trust conveyance of firm and individual property, for the benefit of their creditors. Their liabilities are about $220,000. The firm estimate the value of their property in Providence, Chicago, Newark and Jersey City, N, J., and other places, at three times the amount of their liabilities. Unavailable real estate is said to have been the chief cause of their embarrassment.

It is announced that Isabella, who was in the Queen business in Spain a few years ago, is about to sell off a few more bushels of jewels. She does this every few weeks, and the fact gives rise to the surmise that she must be in the pawnbroker business in the intervals between sales, or is employed to dispose of bankrupt stocks. We wonder if any of Isaac C. Levi's goods could be found in Isabella's possession? We would suggest to Isabella that she should come to this country, if she wants to make a fortune selling jewelry. She would make a splendid advertisement, and any quantity of cheap goods could be worked off to the snobs, who would be sure to swarm around.

The diamond merchants of London have built a joint-stock palace or club-house, for themselves, in Holborn bars. Not that they meet to dine and smoke, and talk of the latest scandal, like their customers in Pall Mall. They combine business with pleasure. Theirs is a club and a diamond exchange in one. The billiard-room, the dining-room and the smoking-room are there, but inseparable from the club are a number of tiny offices, where these possessors of the wealth of Golconda, may barter and sell. They are a strange set, and even the richest do their trade more roughly than many a costermonger. Some of them are accustomed to carry fortunes around with them, and sales take place where they would least be expected. Only the other day a visitor saw a dealer draw from his pocket a dazzling and massive bracelet of gems. He answered the surprise which this movement of his caused, by bringing from his pocket an ingenious combination of a knuckle-duster, a spring dagger and a six-shooter.

Novelties in Jewelry, Etc.

Celluloid jewelry has had its day.

The newest chatelaine bags are of sealskin, with silver mountings.

Back combs of shell or silver are ornamented with a single fern leaf.

Even great painters do not scorn to paint designs for fans nowadays.

Diamonds are worn in invisible settings, and are hung very close to the ear.

There are sixty thousand commercial travelers or "drummers" in the United States.

The finest Mosaic jewelry in raised Venetian Mosaic glass flowers is a revived fashion.

Poetic fans are again fashionable. They appear with love-sick verses inscribed in the center.

Chatelaine watches represent small traveling bags, in the centre of which is the watch.

The new chain lately patented by Messrs. Carter, Howkins & Sloan, attracts a great deal of attention.

Asthore is now the rival word to "Mizpah," for engagement rings, and it means "My darling," in Irish.

The new earrings are smaller than those lately worn, small hoops, keys or crescents being the popular shapes.

The rope chain with alternated parts of Roman gold and platinum is a desirable pattern of gentlemen's chains.

Many new and artistic designs in watch cases, have recently been brought out by Messrs. Robbins & Appleton.

Ve. J. Magnin, Guedin & Co. present many rich novelties in imported jewelry, some of which are exceedingly beautiful.

Fans of fine wire gauze, on which are fine hand-painted designs, are novelties which are sometimes utilized for hand fire-screens.

Indestructible jardinieres are the latest novelties in decorative art, for either indoor or outdoor embellishment.

Jewel-boxes, of onyx, decorated in colors, and mounted in gold, are shown by the Meriden Britannia Company.

Bouquet-holders in the form of lizzards, snakes and alligators, incrusted with diamonds and precious stones, are among the latest imported novelties.

A novelty in bracelets consists of a double coil of elastic gold, which slides upon the arm, and can be worn either at the waist or at the forearm.

Among the latest of fashionable extravagances are *menu* cards, painted on silk, at a cost of $20 each; and point-lace parasols, mounted in solid gold.

Ear-rings are very small, and dead gold is revived in quaint and curious forms. Mosaic jewelry, also, is seen in miniature forms, and shows the finest and most delicate floriated designs.

The new lace pins in fine gold are in the form of tiny oars, miniature brooms, whip handles with the cord wound about them, rolls of music, etc. Some of them are a section of fence, with the bars half down.

Diamonds exhibit many gorgeous devices. Small pendant collars are made wholly of diamonds of different sizes, mounted upon a fine network of silver wire. Still more delicate workmanship of the same sort is arranged to imitate point lace, and sold at $5,000 per yard. A single yard of such lace constitutes a very elegant wedding present.

Among the many novel devices in costly jewelry is the alternating or combining together gems of different colors. Bracelets, for instance, consist of a gold band studded with several large stones, set like nails, one of which may be a ruby, another a diamond, another a sapphire, a fourth an opal, and a fifth a topaz or garnet. Rings are composed of many little hoops of gold, each one set with a small stone, in the same way, and composed of the same variety.

In fancy jewelry the newest thing is a cross, said to be a copy of one worn by the Princess of Wales. There is also a ring, called the engagement ring, copied from a Danish antique; it is a double spiral cord ring, with open ends, like the fashionable bracelets: it is called the Bernholm ring. The newest Porte-bonheur bracelet is composed of three rings chained together; one ring is made with opals, one with turquoises, and the third of rubies.

Among the new things in fashion are some charming screen-shaped fans of fine wire, upon which are hand paintings, which show the same on both sides, and are used for either fans or fire-screens. Others are made of brocaded silk in small patterns and cashmere colors. The hand-painted fans are, however, still considered the most beautiful and artistic, and great painters do not hesitate to create designs for them of artistic beauty and originality.

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THOSE OF OUR READERS WHOSE TERM OF SUBSCRIPTION EXPIRES WITH THIS ISSUE, AND WHO HAVE BEEN NOTIFIED BY OUR USUAL CIRCULAR, WILL CONFER A FAVOR BY RESPONDING AS PROMPTLY AS POSSIBLE, AS ALL SUBSCRIPTIONS TERMINATING WITH THIS VOLUME WILL BE DISCONTINUED IF NOT RENEWED.

Close of the Ninth Volume.

THE JEWELERS' CIRCULAR completes its Ninth Volume with this number. In looking over the volumes that have been closed, we are astonished at the amount of reading matter we have given our readers from month to month. In addition to timely discussions of the many phases through which the jewelry trade has gone in the past nine years, the CIRCULAR has printed many articles of great practical value to the workmen in the trade, which, were they compiled in book form, would make several large volumes. Our aim has been to cater to the best intelligence in the trade, and to seek its best interests at all times. There have been times when it would have been to our pecuniary advantage to have taken the opposite course, and to have made the CIRCULAR the apologist for fraud and deception, but we are thankful that we have had the strength to resist these temptations. We may have made errors of judgment, but the integrity of the CIRCULAR is unassailable. We are pleased to record the fact that its course has been so far approved by the trade that our business has been made fairly profitable, and the success of the CIRCULAR become a long established fact. Our friends and readers we number by thousands, and they are to be found in every land where the jeweler's art is practiced. From a pecuniary standpoint, the trade has dealt kindly with us, and, in all other respects, with the utmost courtesy and friendliness. While we have had our share of burdens to bear during the hard times, we have never failed to receive the confidence and sympathy of the trade in general. For all this we are profoundly grateful. As to the future of the CIRCULAR we have no promises to make. Our record is already made up, and on this we stand. Yet we do not propose to stand still, by any means. While we claim to have given to the jewelry trade a journal such as no other trade can equal in point of elegance, our ambition is not yet satisfied. We shall make changes and improvements from time to time, as circumstances require, and shall strive at all times to maintain its literary standard, and its reputation as a purveyor of practical knowledge. We expect to make many new friends this year, and beg to suggest to them that if they want to get well acquainted with us, they should let their subscriptions commence with the February issue.

Gold at Par.

DURING the past two weeks gold has been sold in the open markets of this city at par; or, to put it correctly, currency has brought its face value in gold. This is the first time that such a thing has occurred since before the war. During the intervening time gold has sold at rates varying from ½ per cent. to 185 advance for currency. It is highly creditable to our government that, notwithstanding our immense debt, the constant tendency has been towards specie resumption. In spite of the demagoguery of numerous politicians, the executive officers of the government have devoted their energy and their talents to the maintainence of the national credit, and the surest way to do this was to get back to a specie basis. Five years ago Congress declared that, on the 1st day of January, 1879, specie payments should be resumed. No effort has been spared by scheming politicians and alleged financiers to secure the repeal of this law, but in vain. The people hailed it with delight, and, accepting the promise in good faith, set about putting their houses in order to meet the change from an irredeemable paper currency to a specie basis. As a consequence, the result sought was practically accomplished in commercial avenues before the time fixed by Congress. The American people are entitled to a great amount of praise for the patience and determination they have shown in regard to preserving the nation's credit. During these weary years of business prostration they have borne the heavy burdens imposed by the government cheerfully, rejoicing to know that our war obligations were being steadily reduced, and that the government was rapidly advancing in the confidence and esteem of other nations. It has been a trying time for all, but the results attained have been well worth the sacrifices made.

What effect will specie resumption, as practically illustrated by the sale of gold at par in currency, have on business? We do not anticipate any immediate marked effect, yet it cannot fail to be beneficial. Specie resumption is no longer a matter for Congressional speculation, an idea to be battled over and made a subject for the display of sectional and factional animosities, but is an accomplished

fact. The determination of practical business men has done what theorizing self-styled statesmen pronounced impossible. The result has been reached so gradually that the business of the country has accommodated itself to the change without any violent commotion; this, too, in face of the universal depreciation of values that followed the panic of 1873. Having been thus gradually reached, the change from a currency to a specie basis will not, of itself produce a marked effect upon business which has always accommodated itself to changing circumstances. It will very naturally tend to make business men more hopeful for the future, and to give them more confidence in each other. Satisfied with the financial outlook, they will be more ready to undertake new enterprises and to enlarge their spheres of operation. This will be done gradually, however, for confidence is a matter of slow growth, especially after receiving so severe a shock as has been administered during the past few years. It may be said that the country has, financially and commercially, reached "hard-pan." The prospect is that from this time forth business will improve slowly but surely, until that condition of prosperity is reached that should be habitual with our people. With gold at par, the energy and enterprise which characterise our business men should not be long in shaking off the depression which has fallen upon them.

South American Trade.

THE present administration is manifesting an unusual interest in the development of new avenues of trade, whereby our manufacturers may the more readily dispose of their surplus products President Hayes recently sent a special message to Congress on this subject, to which Secretary Evarts added many valuable documents received from our ministers and consuls abroad. A delegation of prominent merchants, representing both the east and the west, is now on a "prospecting" tour through Mexico, to ascertain what opportunities there are for American manufacturers to obtain a foothold there. This excursion has been in contemplation for some time, and the most cordial assurances of a hearty welcome have been received from prominent Mexican officials and business men. The excursionists are to be received with all the honors in various cities, and every facility given them to learn the conditions of trade and the wants of the people.

Heretofore European manufacturers have controlled the bulk of the South American trade. Why this has been permitted by our people has always been a mystery which, as Dundreary says, "no fellow can find out." Our manufacturers invade Europe, and compete successfully with foreign manufacturers upon their own soil, but have permitted those same competitors to cross the ocean and control the commerce and trade of our nearest neighbors. This trade belongs to us by right of geographical location. Nature has given us every advantage, but we have failed to avail ourselves of it. The British government has always encouraged traffic with other nations, and has given it a helping hand whenever it required such fostering care. Steamship lines have been subsidied and maintained partly at government expense, when, without such help, they must have languished and failed. This has been a great help to British commerce, enabling merchants to maintain themselves upon foreign soil when they could not otherwise have done so. President Hayes suggests that Congress might well consider the policy of doing something of this kind in the interests of the trade and commerce of this country, now suffering from the effects of six years of reverses and demoralization such as have seldom, if ever, been known before. We do not anticipate that the present Congress will do anything in the matter as that body has not looked kindly upon any project calculated to aid great public enterprises since the panic of 1873. It was appealed to, in the interest of unemployed labor and capital, to aid, by its endorsement, the construction of the Union Pacific Railroads and to aid steamship enterprises, but has steadfastly refused to do so, leaving business men to work out of the distressing situation in which they had been plunged, and to the making of which Congress, more than any other one thing, had contributed. It is scarcely probable that now, when our financial distress is slowly but surely disappearing, Congress will change its policy.

As to trade with southern countries, it must be conducted upon an entirely different basis than it has been done before it can be profitable. Many of our merchants and manufacturers have already made ventures in that direction, to their cost. The business habits of the residents of those countries need to be reformed, and some higher conception of their duties as honorable men instilled into them. A desultory trade cannot be maintained profitably with them. To put it tersely, they need watching. While they are willing to receive all the goods that can be consigned to them, they are very lax in their notions of payment. If we would succeed, we must have local branches of American houses established on their soil. This is the secret of the success of the English. Americans have been in the habit of sending goods there on consignment, while the English dealers have resident agents or branch establishments. The English, by this means, collect their dues, while our merchants have come out minus. There is no question but the trade of the South American States is worth a vigorous competition with our European rivals, but at present the Americans are handicapped by trying to do business at long range. An army is always in danger that gets too far away from its base of supplies. Resident agents are necessary to make this South American or Mexican trade profitable. Congress, if it will, can do much to give an impetus to it. One of the first essentials is a postal treaty which shall do away with the internal postal arrangements of those countries. At present our merchants cannot reach probable customers by mail because of the local postal regulations. Under favorable auspices they can compete as satisfactorily with English products on South American soil as they have on British soil, and that we can beat them in their own markets, both as to quality and price, is a fact which has of late filled their newspapers with sounds of woe and lamentation.

Failures of 1878.

THE failures of 1878 in this city amounted to 917, a number in excess of that of any other year. These failures represented liabilities of $63,858,403, and assets of $18,693,531. The great increase was, of course, attributable to the repeal of the Bankrupt Law, which was taken advantage of by all who could. The large number of failures of the past year may be regarded as a purging of the body commercial, which leaves it all the healthier. The small and unhealthy firms have been crowded out to the improvement of trade generally. Many houses suspended that were regarded as perfectly solvent. It is safe to say that the 917 firms that suspended during the year 1878 will not be equalled for many years to come. It was the passing away of the last who struggled against the effects of the reaction of 1873. There are many houses to-day which are almost to the wall, and many of those will go over; but if business is encouraged, as there is every reason to hope that it will be from this time henceforth, others will feel the quickening impulse of better times and float into a safe harbor. The figures of 1878 are certainly gloomy enough, but there is no danger that the year 1879 will witness a repetition of the disasters they represent.

The Line Drawn.

THE firm of Mulford & Bonnet, of this city, deserve a word of commendation for the stand which they have recently taken against a firm who are but representatives of the class of pretended merchants who have infested the jewelry trade for the past few years, Between the months of March and April last, they were induced by reason of verbal representations made to them by the firm of Wachter Bros., of Troy, New York, as to their solvency and ability to pay cash for goods, and also the intention to buy no other goods

on credit, to sell quite a large bill of goods to the Wachters on a credit of sixty days. By the time that the credit expired the usual crop of judgments and bills of sale presented themselves, and one Lucas, the father-in-law of Edward A. F. Wachter, was successful in causing the sale under an execution on a judgment in his favor for a large sum, of all the goods purchased by his son-in-law of Mulford & Bonnet. Other evidence pointed to the removal of part of the stock, alteration of books, etc. Mulford & Bonnet went to Messrs. Safford & Fornachon, of this city, and presented their case, that firm pushed the matter, and through their counsel, A. G. Vanderpool, Esq., fought the case at every point, and after a trial which occupied two days before judge and jury, a judgment was obtained against the defendants and they will now suffer in the flesh for their peculiar business practices. Mention is made of this case to the end that the trade may be encouraged to draw a broad line between the honest but unfortunate merchant and that class of moral lepers, who, by fraud in representation and in the sequestration of property, have become rich at the expense of the trade. In the argument of the counsel in this case, and in the charge of Judge Van Brunt, the line is clearly drawn and the law fixed, that a business man has a perfect right to rely upon the word of a would be purchaser, and to take his representations as truth, and that for their falsity the debtor can be punished.

Our First Death Loss Paid.

THE following communication has been received by the Secretary of the Jewelers' League, which is sufficiently eloquent to speak for itself :

NEW YORK, December 7, 1878.

MR. J. D. YERRINGTON, *Secretary of the Jewelers' League :*

DEAR SIR :—I have this day received the check of the Jewelers' League in full of my claim, as beneficiary of my son Charles William Menge, receipt of which is here acknowledged.

Permit me to express to you and through you to the members of the League my warm appreciation of the kindness shown me in the hour of my affliction. I feel that the same love and affection for home and family that prompted him to become a member of your organization and share with you its responsibility, animates your action in forwarding me the results of its benefits.

Wishing your benificent organization a happy and prosperous future,

I remain very truly yours,

MRS. EMILIE MENGE.

THE partnership heretofore existing between Ethel C. Hine, and Seth E. Thomas, under the firm name of the American Clock Co., was dissolved on January 1st. The American Clock Company has been in business for many years, having acquired a most enviable reputation for the excellence of its goods and the integrity which characterized its dealings. It was the representative and agents of several companies, which, a few years since, were of minor importance, but whose business has grown until it seemed for the interest of each that it should be conducted independent of the other Hereafter the E. N. Welch Manufacturing Company and Welch, Spring & Co. will have their headquarters at No. 32 Warren Street; the New Haven Clock Company will be found at No. 62 Reade Street, and the Seth Thomas Clock Company and Seth Thomas' Sons & Co. will carry on business at No. 20 Murray Street. Mr. Hine will remain in charge of the affairs of the American Clock Company, to liquidate its business, his headquarters being at No. 20 Murray Street. The old familiar American Watch Company will be missed from the trade, but it is a satisfaction to know that the enterprising gentlemen that composed it are still to be identified with the business.

MR. Gustav Jacoby is a resident of Berlin, Germany. Mr. Jacoby is, evidently, an enterprising man, if persistency which admits of no rebuff, be evidence of enterprise. Mr. Jacoby has acquired a chronic habit of sending to manufacturers in this country for samples of their goods, promising, if they are suitable to his market, to order liberally. Mr. Jacoby does not confine his desires to any particular line of goods, but is willing to receive samples of plate, jewelry, plated ware, anything, in short, that has an intrinsic value. But Mr. Jacoby omits a very important item that is found requisite to extended commercial transactions with strangers. He neither encloses negotiable paper with his requests, nor submits references as to his character and standing. This guileless Berliner, whose last name is Jacoby, evidently entertains a refreshing idea of the charming innocence of our people. It reminds us of that pathetic nursery tale that relates the adventures of Simple Simon who met a pie man going to a fair, and this Simple Simon said to the pie man let me taste your ware. But the wary pie man remarked to Simple Simon, before we enter into any transactions having a commercial tendency, I should prefer to see the color of your money. With our knowledge of the ways of Simple Simons in general, we cannot but applaud the sagacity of the pie man. We commend this little story with its impressive moral, to the studious attention of Mr. Jacoby, whose front name is Gustav, of Berlin.

Gilding Watch Movements.

OUR esteemed contemporary, the *British Watchmaker and Silversmith*, gives the following useful receipt for re-gilding watch movements :—For old work it must be prepared by first scouring off all the remains of the old gilding with ground pumice stone, a stiff brush and water; after washing clean, the surface must be matted to give it the rough granulated appearance of fire-gilding. This is done by leaving it in the following solution while you slowly count five: 1 oz. pure nitric acid; ¼ oz. sulphuric acid; 3 dwts. rock salt. Dissolve the salt in the sulphuric acid, then add the nitric acid slowly. The articles must then be thoroughly washed in clean water. The following gold solution is to be employed: 1 quart. rain water; 3 dwts. dentist foil (pure gold); 6 grs. pure copper (watch dial); 1½ oz. cyanuret of potash. The solution is prepared as follows: Dissolve the gold ½ oz. of nitro-muriatic acid (2 parts hydrochloric, 1 part nitric). After the gold is dissolved, add the copper; leave the solution to stand on a warm sand-bath till evaporated to a thickish red liquid. (The chloride of gold of commerce will not do, because it deposits the gold in a greenish color, which is not desirable). Then add the cyanuret of potash to the water, and add the dissolved gold. A convenient way for gilding the articles is to take a strip of clean zinc, say an inch in width, drill half a dozen or more holes in the lower edge, and attach in these holes fine copper wire, which can be left permanently attached for convenience. Then twist a wire around each little piece to be gilded, in such a manner as to make a perfect connection, and yet not interfere with the proper gilding of the part of the movement to be seen. After all are attached which you wish to gild at once, immerse them in the gold solution, allowing the zinc to dip into it from 1-8 to 1-2 an inch, depending on the total surface of the articles to be gilded. The amount of zinc surface exposed to the action of the solution determines the quantity of electric current induced (in this matter practice must be your guide); leave in the solution from five to eight minutes, as your judgment and experience dictate.

In gilding wheels the pinions may not be removed (they must not be put in the "matting" solution), as the gold that attaches to the polished steel work can be easily removed. After the necessary handling, previous to gilding, it is well to rinse off the articles in alcohol to remove any impurity that may have attached to them. A chemically clean surface is necessary to render the deposits of gold perfect and uniform. Finish with fine scratch-brush and soap suds, or slippery-elm water. By this method the articles will have the appearance of new work, but it is essential that the materials employed should be pure, otherwise the results would not be satisfactory.

THE NICKEL PLATING PATENTS.—The suits of the United Nickel Company of New York, lately decided, and now pending in the United States Circuit Court, Blatchford, Judge, are to settle the validity of the patents. There is now a suit in Boston awaiting the decision of Judge Lowell, which will determine whether the Adams patents for nickel plating belong to the United States Nickel Company of New York, or the National Nickel Plating Association of Boston. In case of a decision adverse to the United Nickel Company, the parties paying royalty to them are again liable to the Boston Company.

Ancient Irish Jewelry.

THE collection of ancient jewelry preserved in the Museum of the Royal Irish Academy in Dublin, is well worthy of a visit and close inspection.

The articles consist principally of crosses, croziers, brooches, pins, rings, collars girdles and many strange articles whose use is now only a matter of conjecture. Some idea of the value of the collection can be estimated from the gold ornaments alone being valued at $200,000, exclusive of workmanship or antiquity. Articles of gold and silver are frequently found by the peasantry, who take them to the nearest jewelers where they are sold for old metal and melted up, and in such quantities has gold been found that Ireland must have been a great gold-producing country at one time, though there is but one gold mine at work at present.

Nearly all the ornaments in the Museum are Celtic, and are most beautifully wrought in pure metal, without alloy, the ornamentations being in the interlaced or Celtic pattern. The best specimen of this kind of work in the world is preserved there; it is known as the Tara brooch, in form it resembles a padlock, with an open division down the middle of the lock through which a long pin moves, the pin is fastened to the hasp around which it moves. On each side the faces are covered with the most elaborate interlaced work with raised gold beads and different colored crystals. The brooch itself is about 4½ inches wide, and the gold pin, which is as thick as a lead pencil, is about 7 inches long; there is also a plaited gold string and tassel attaches, evidently intended to secure the brooch. This beautiful piece of workmanship is supposed to have been used by some king as a shawl or plaid brooch.

The Messrs. Waterhouse, of Dublin, the eminent jewelers, have attempted a copy of this article, for which purpose they brought artists from Italy, but the copy, when placed beside the original, is very tame and inferior. The work on the original is so fine that antiquarians are of opinion that the magnifying glass must have been known to the ancient Irish jewelers. There are a good many other brooches of the same description but not so large or ornamental, wrought in gold, silver and bronze, some down to less than 1 inch in diameter.

The pins are nearly all formed of a ring which is attached to the pin itself, some of them are beautifully wrought with ornaments projecting from the sides of the ring, the most beautiful of which is called the Fingal pin, and has been reproduced by Mr. Brunker, of Dublin, who has registered the pattern. The majority of the old pins had very long shanks, some of them 7 inches in length and reducing down to ¾ of an inch.

There are 4 croziers in the collection, 2 of them are tolerably plain and one of them extremely ornamented; the form is a serpent twisting in a volute with a human figure in the center, the figure is striking the serpent with a spear; the serpent is beautifully enamelled in different colors, and where the end of the head joins the staff the metal work is finished with four grotesque heads.

The goblets and chalices, of which there are 7 or 8 specimens, are mostly of silver with gold ornaments, generally a band of intricate interlaced work with 4 crystals in the band, the work is so fine that it was evidently wrought with a magnifying glass, and in some cases the most beautifully wrought part of the cup is the under side, which would seem to indicate that those cups when not in use were turned upside down.

The collection of mugs are nearly all ecclesiastical, most of them are very heavy, and in comparison with the other work are tolerably coarse, they are wrought in gold, silver and bronze, some of them are very large.

The crosses are generally plain, none of the older ones have any figure on them, most of them are silver and there is not, with the exception of very small ones, one wrought completely in gold. The cross of Cory is made of brass beautifully worked in the interlaced pattern in panels, it is about 2 feet 6 inches high and about 2 feet wide across the arms, the sides are plain, bent in 2 curves in each arm or each side and three in the shaft, the corners of the curves are ornamented with large crystals, and in the center is a crystal about 1¼ inches long and 1 inch wide with a pointed edge outward, it is supposed to contain, or to have contained, a piece of the cross; all the work around and within 1½ inches of this is pure gold, and would appear as if put in afterward, the work is exquisite and contains an Irish inscription which settles the date of this beautiful specimen of art in the 11th century; this cross was preserved in Cory Abbey, County Mayo, until it was purchased for the Royal Irish Academy, a sale that nearly cost the Roman Catholic priest his life.

There are about 6 collars of gold, supposed to be of Druidical origin, they vary from 6 inches to 3 deep in the widest part, and are about as thick as stout drawing paper and have solid knobs at the ends. In the next case are some hollow gold balls also supposed to be Druidical, both collars and balls are stamped with a bold pattern of raised balls and lines.

In the next case are some extraordinary pieces of gold made in the form of an ordinary dish cover handle, supposed to be tribute vases, the largest one weighs 300 English sovereigns and the smallest about 3. Next to this case are some beautiful twisted pieces, supposed to be used as girdles, they have a hook at each end. There are two of these twists which Sir William Fanbain, of Manchester, has failed to copy, even with the aid of machinery.

There are also some large pointed crystals in gold settings which were used for ordeals, the Irish believing that when a murderer looked into one he saw himself committing the deed, and his sentence was given according to the effect it had on him. Besides these there are many other beautiful specimens of the goldsmiths art as relic cases, etc., all of which tend to show that the Irish jeweler must have had tools of exquisite make, and that the people who left such relics behind them cannot have been the barbarians they are supposed. Would it not be better to study these beautiful specimens than endeavor to reproduce Cyprian ornaments?

Silver Dollars.

Editor of the Jewelers' Circular:

AS the Mexican and trade dollars are now the cause of much trouble, loss, and many disputes, you will please throw some light on the subject for the benefit of your readers who do not yet understand the *ignis fatus*. In the first place, I wish to ask you what is the actual value in gold coin of one pound troy of the silver bullion contained in the following coins respectively: Mexican dollars from 1876 back—as the Mexican dollars of 1878 are about three grains heavier than those of 1875–6, and the same weight as our trade dollar—the U. S. trade dollar, the old dollar, the new legal dollar, and the half dollars, which are 38 grains lighter than the trade or Mexican dollars? They are all said to be of the same degree of fineness, viz., 9-10 pure silver to 1-10 alloy, and silver is of the same relative value with gold as fixed by law, viz., 16 lbs. of silver to 1 of gold. I find upon actual test that $223 in gold coin weigh one pound troy, and $221.25 in Mexican dollars of '75–6 weigh 16 pounds troy, thus making the Mexican dollars which pass for only 85 cents, and in some places 80 cents, worth 1-6 more in bullion than it is in coin. Manufacturing silversmiths charge $1.25 per ounce for coin silver; this would make 14 Mexican dollars, which weigh 12 oz. 3 dwts. and 10 grs., worth $15.20. Now, I wish to know how we are to arrive at the actual value of these coins? Please give us a plain practical solution of the whole, and a correct rule to be guided by. M. D. K.

Our correspondent should understand that the government standard of value of silver bullion and the commercial value of the same differs very materially, the commercial value fluctuating according to the rules of supply and demand. Before the war silver sold for $1.38 per ounce gold, but has lately sold as low as $1.04 and $1.05. The government figures the new dollar as 16 to 1, and bullion at the rate of $1.38, yet the commercial value of bullion is very much lower than this at present. Government arbitrarily fixes the value of its coin, while its actual or commercial value is regulated by the exigencies of trade. The actual value of any silver dollar is simply what the silver in it is worth at the market value of bullion. To designate the actual value of the various coins named by our correspondent would necessitate the publication of a daily bulletin of the sales of silver bullion.

Practical Hints on Watch Repairing.

By Excelsior.—No. 46.

EXAMINING THE DETACHED LEVER OR "ANKER" WATCH.—CONCLUDED.

(721) Examine the hair-spring thoroughly; first see that the escapement is in best, (49); that the spring stands level; that it does not bulge or weave, around the center, when the balance vibrates; that the coils are concentric, or, rather, that they follow the true spiral form from the center out, so that, when the balance vibrates, the coils do not have a "double shake," but move smoothly, in one direction only, at each vibration; that the outer coil is free between the regulator pins when at rest, and remains so through the sweep of the regulator from "fast" to "slow;" that it cannot touch the center wheel, nor the inside of the hair-spring stud, nor the waste end of the spring, nor the balance bridge, or the plate; that the second coil cannot touch the inner regulator pin, nor the foot of the outer one or turn-piece; that the coils cannot come together in running, (38), etc. Of course, the hair-spring collet should not rub on the upper balance jewels, (when the watch is held dial up), nor on the heads of the screws to the regulator nut,—and the shape of the central coil should have been made correct, (38), during the course of the repairs. Make the balance vibrate freely, and see if the motion dies down gradually and slowly, or quickly. If there is any catching or sudden stopping, either the escape wheel teeth rest against the face of the pallets and prevent the vibration of the fork, or there is some defect in the fork-and-roller action or the safety action. If the former, press the wheel a little forward or back till it will leave the pallets free to vibrate. and repeat the test. If the latter, examine and correct those actions as directed in the articles on the Detached Lever Escapement. It should be remembered that, during all the preceding tests, the mainspring is not wound at all, but the train is perfectly free and loose, the same as if the barrel were entirely removed.

(722) Having corrected all faults as directed, we now wind up the spring two or three teeth (no more,) of the rachet, (the stop works being on, and adjusted,) and observe the action. It should, at this its lowest point, have a good motion, in any position, free from any weakness, wavering, or uncertainty as to its going, (433, 434). Hold it in the horizontal position, till it acquires its normal extent of vibration, then quickly reverse it to dial up, using the hand mirror to observe its motion, which should be the same as in the other horizontal position. Also try it in the four vertical positions, and with the plate held neither horizontal nor vertical, but between the two, or diagonally,—waiting in each position for the vibrations to settle to their permanent extent. If in any of these positions, the motion falls off considerably, there is too much friction, or misfitting, and the cause should be looked up. If there *is about the same* motion in the several vertical positions, and that motion is considerably smaller than that in the horizontal positions, then the cause is the greater friction in the former. In a fine watch all this has been seen to, during the adjustment to positions. See sections (80) to (87), in "Practical Treatise on the Balance Spring, and the Compensation Balance," for directions. The testing of this adjustment, and the correcting of any defect in it, should have been done in taking the movement down, so that the present test will only ascertain if all is still correct. In common movements, this difference between the vibrations in the horizontal and the vertical positions is passed as immaterial, unless the latter are very considerably, say one-third of a turn, smaller. If so, the escapement is unfit to be passed, even in a cheap watch.

(723) But if there is considerable difference in the extents of the vibrations when held in the different vertical positions, this is caused by some fault in the escapement fitting—provided that the jewels and pivots are sound, tight, etc., (93). When the difference is found greatest between the position in which the balance falls towards the lever, and from it, the trouble is either in the rubbing of the guard point on the roller table, (safety action,) or in the manner of the ruby pin entering or leaving the notch in the lever fork, (fork and roller action,) and those actions should be corrected if the difference of the vibrations is considerable, even in a common watch. When all these points have been sufficiently attended to, there is a periodical variation in the balance vibrations, which may often be of service in detecting unnoticed faults in the train. The mainspring being wound up a quarter turn of the rachet, hold the movement in the horizontal position, and watch the balance closely. If the vibrations become alternately larger and smaller, and if the change occurs regularly with each revolution of the escape wheel, the trouble is probably in that or its pinion: the wheel may not be staked concentrically on the pinion, making one side too full, or the other too scant; it may not be true in the flat, and the highest portion rubs up under some part in passing it; teeth worn, damaged, or improperly shaped; the wheel may be too close to the lever pallets, and clog or catch; or too far off, and strike on the corner or impulse plane, instead of on the locking face; dirt in the pinion, checking the motion whenever that side comes around to the fourth wheel; a pinion leaf bent, cut or bruised, and producing the same effect. In any of these cases, the remedy is obvious.

(724) If the falling off in the motion corresponds with the revolutions of the fourth wheel, and occurs less frequently than the turns of the escape wheel, look for dirt between the teeth which gear into the escape pinion when the falling off occurs; or a tooth bent, bruised or wrongly shaped; wheel not round, and that side too full or too scant; and other faults named under Fourth Wheel. If the falling off occurs still more rarely than once in a minute, the trouble is yet further back, and may be noticed when the center wheel teeth pass the leaves of the third pinion. If this is suspected, make a slight mark on the wheel rim, exactly in the line of centers, *i. e.*, exactly opposite the center of the pinion, and examine that tooth after it gets away from the third bridge. It may, however, be in the third wheel depthing, either at some particular tooth, or as each tooth passes the fourth pinion, in which case the falling off will be noticed about every thirty beats, on the average. Or, finally, it may result from a defective depthing between the main wheel and the center pinion, when it will occur at intervals of from five to six minutes, according to the numbers of teeth and pinion leaves. None of these faults *should* be found after repairing a movement and when putting it together again. Nevertheless, as we are liable to overlook a point sometimes, it is well to notice all these things, and keep watch for possibly forgotten defects. It should be said, however, with regard to the main wheel depthing, that, even if that depthing is carefully adjusted, there will generally be a slight variation in the balance vibration, and if this does not exceed 10° or 15° it is usually left so. This subject will be further explained in the article on Depthings.

(725) In all these cases, it is pre-supposed that the balance has a good free motion, in all positions. If it has not, and there is any doubt as to where the hindrance is, let down the mainspring, take out the lever, and try the balance alone, in all positions, and with both large and small vibrations. The fault being removed, so that the watch, in all positions, is certain to go with a brisk and vigorous motion when the mainspring is at its weakest, (wound two or three teeth of the rachet,) we may feel confident that, with it properly wound, the watch will do good service. In a cheap watch, it may do to thus try it with the mainspring let down as it will be after 24 or 25 hours running, instead of entirely down, as above. It must then be free from any danger of setting or stopping, and absolutely certain to do good service. If there is the least appearance of faltering or weakness, in any position, there is some alteration required in the movement, which must not be put up till that is made, and this fault entirely removed. As before said, all needed repairs should be made before cleaning, so that these faults will not be found

after putting together again, but for the sake of safety the workman should make a practice to apply these tests in setting up a movement, and not be satisfied with anything short of the action just described.

(726) We now oil the holes under the dial,—if the escapement has end-stones, those holes should have been oiled, top and bottom, before putting in the wheel and lever. Put on the minute and hour wheels, try them, (648,) put on the dial and fasten, turning the screws up or out till they hold the posts securely, but not straining them too tightly. See that the dial cannot shift its position and carry the shoulder in the post off the screw-heads, and also that the end of the post has not been bent back in the notch by that common habit of young workmen, turning the screws *out*, instead of in, when taking the dial off. This is the cause of most of the dial posts broken off, etc. They should remember to always turn the screws further in, in taking the dial off; and out, when putting it back on. Try the freedom of the hour wheel, put on the second hand and adjust it, (194, 638), then the hour hand, try its freedom when pressed to its lowest end shake, then with the key turn the hour hand to point exactly to I, and put on the minute hand pointing to the dot of the XII, drive it to its place, and again try the freedom of the hour hand. Now adjust the hights of the hands, to prevent interference. (193), (196), and finally oil the upper pivot holes, and the lever pallets. Many workmen object to this last, but in all ordinary watches it is better to oil them. In fine movements which are so perfect as to not need oil on the pallets, it may be dispensed with but such are the rare exceptions, not the rule. The foregoing directions apply to bridge movements. With half or three-quarter plates, or other different movements, the course is suitably modified.

(727) In putting a movement into the case, the younger workmen need a word of caution. Never try to force it in, but if it goes hard, stop and see what keeps it up, or take it out and begin over. The highest pin in the edge of the plate, or the one which comes up nearest to the dial, goes into the notch in the case, and shows the proper position,—the others reach under the rim, to hold the movement down. If inconvenient to fit it in by holding the edges of the plate in the fingers, lay it on the rim, then take hold of the center or winding square with smooth pliers, and lift and adjust in position. If the squares have dirt cups around them, and you cannot get a good hold with the pliers, take the movement by its center, between the thumb and forefinger,—putting a bit of paper over the gilding, and another over the hands, to prevent touching with the skin. Having the pin in the notch, and that side of the movement held as high as the other pins will allow, if the other side will not go down to its place with very moderate pressure there must be some obstruction which should be removed; forcing it in will be at the risk of cracking the dial, springing it out of place, or breaking something. Be specially careful when the balance rim, end of lever fork, etc., project out beyond the edge of the plate, or you may have a bent or broken pivot.

(728) The movement being carefully placed in the case, securely and tightly fastened, (643), the dial is wiped off clean, and the glass bezel put on. See that the minute hand clears both glass and dial, and that the motion of the balance is still unchanged when the spring is wound up two or three teeth. Then listen to the tick in all positions to see if it is clear, and free from rubbing or catching, and set the hands exactly to time. Finally book the repairs, mark the number in the case, wipe it off clean with the chamois skin,—and the job is done, and well done. In a fine movement, however, you have yet to test the adjustments to isochronism, and temperatures, either before or after putting it in the case, and to perfect them if they have been disturbed during the cleaning and repairing. Full directions for doing this are given in the "Practical Treatise," etc. The regulation or rating of a fine movement, also, requires very different manipulation from merely shoving the regulator one way or the other, which may do for common watches. Instructions for rating, without injuring the adjustments, (which an inexperienced workman is almost certain to do,) are also given in the "Practical Treatise," before spoken of. This method of "setting up," (714 to 728), is a very different proceeding from that described in section (276). But, in following the former method, you feel assured that nothing more remains to be seen to, except the regulating. In the latter, there is no certainty that any part is right, and there may be a dozen unnoticed defects to cause stoppage, or prevent keeping time. The former will require more time, but not so much as might be supposed, after getting used to it. Nevertheless, it should be strictly followed with a good movement, and, in all essential points, even with cheap watches. It is the method of the skillful and conscientious workman, while the latter is that of the botch and the charlatan.

(729) *Comparing Time, in Rating.*—My attention has been called to the disagreement between the method of comparing a watch with the regulator, in rating, described in the Practical Treatise on the Balance Spring, etc., pages 141, 142, and the one recommended in Reid's Treatise on Clock and Watch Making, Fourth Edition, Blackie & Son, MDCCCXLIX, page 153. Reid's method is as follows:—"In comparing a clock or chronometer with the regulating clock, when they are under regulation, there is in this, as well as in every other thing, a neat or proper method. Suppose the clock or watch under regulation is found to be faster than the regulating clock, count in your own mind the beats or seconds of the regulating clock by the ear, keeping, at the same time, your eye steadily on the seconds-hand of the clock or chronometer under regulation, and when the beat of the regulator is on the sixtieth second, mark well where the seconds-hand of the piece under regulation is, and you will have exactly what it has gained. On the other hand, should the piece under regulation be losing, count the beats of the regulating clock in your own mind, knowing, at the same time, where the seconds hand of it is at, and keeping your eye on the seconds hand of the piece to be regulated, notice the instant when the seconds-hand of it comes to the sixtieth second, and what beat or second the regulator is at, and you have the difference, or the number of seconds which the clock or chronometer may have lost. When addition or subtraction is used, with the difference between two clocks, where one of them is to be regulated, errors may take place; but, in the method we have just described, this is not likely to happen."

(730) According to the method recommended in the Practical Treatise, etc., "All trials and observations should begin and end when the seconds-hand of your regulator is at the 60, unless the seconds dial of the watch is imperfectly spaced off; if so, then at the nearest 60 upon that." Disregarding the above noted exception, for the present, it will be seen that both methods are the same for a gaining watch, but different for one which is losing. Evidently, one of them will give a false indication. Which is correct? As the principle will be unaffected thereby, we will suppose, in order to make the matter appear perfectly clear, that our watch runs very much too slow. On timing it by my method, for one minute, or while the seconds-hand of the regulator moves from 60 around to 60 again, the seconds-hand of the watch is at 45 seconds, and the watch loses 15 seconds per minute. But by Reid's method, when the seconds-hand had come up to the 60, the seconds-hand on the regulator is at the 20th second past its 60. He would therefore say that the watch lost 20 seconds in a minute. A moment's reflection, however, will convince the workman that such cannot be the case, but the fact is that the watch required 80 seconds for doing what it should have accomplished in 60. The simple proportion of the rule-of-three will show that, as the watch fell back 20 indicated seconds in 80 seconds of true time, it would fall back 15 seconds in one minute, (80:20::60:15), which proves my method to be the correct one, by the figures given by the other method. All this may be a comparatively unimportant matter in regulating common watches, but it is far otherwise when rating ship chronometers, as the safety of both property and lives depends on the correct-

ness of the rate of their chronometers, in calculating their positions.

(731) Let us now carry out in practice the case of a defectively spaced seconds dial, according to the rule stated in the exception noted above, and see whether that is also correct. When the watch loses time, the method of observation given is the same as Reid's, and the real loss must be found by calculation, as described in section (730). If the watch gains the method is different from Reid's, and also from my method for correct dials, previously stated, and the true gain must here also be got by calculation. For instance, if the seconds-hand of the regulator was at 45, when that of the watch reached its 60, the watch did not gain 15, but 20, seconds per minute, (45:60::60:80), showing that the watch would indicate 80 seconds in one minute of true time. As calculation is to be avoided whenever practicable, the method given in the Practical Treatise, etc., will be found preferable to any other for all cases except when the irregular markings of the dial will prevent a correct observation being made by it. This is easily ascertained, by watching the pendulum ball as directed on page 142, and noticing whether the seconds-hand of the watch is exactly at the proper marks, at each beat of the regulator,—at least in that part of the dial which will be used during the observation. If not, the method last given or observing at the 60 of the watch, with subsequent calculation, as just described, must be employed for getting accurate ratings. But for common watches, the method described in the Practical Treatise, etc., will be close enough, and will require no calculation, whether they gain or lose.

(732) One other point should be mentioned in this connection. Watches are sometimes found, the seconds dial of which does not show one minute while the seconds-hand goes from its 60 around to the 60 again, owing to improper numbers of wheel teeth and pinion leaves in the train,—although the minute and hour hands may indicate correct time. Before timing a common sort of watch by the seconds-hand, test this point by noticing whether the minute hand passes exactly between two minute-marks while the seconds-hand goes around once; or, whether the seconds and minute hands, after being once made to begin the minutes together, continue to coincide, as they should, each minute. A failure to notice this defect has puzzled many a workman in trying to regulate closely such a watch, and has caused the ruin of many a hair-spring, in fitting a new one in it. He would break it off to the length which would give the right number of vibrations while the seconds-hand went around once, only to find, on putting the watch up for regulation, that it would gain or lose from two to six hours a day. In such a case, the watch must of course be regulated by its minute hand, and, if the minute dial is also imperfectly spaced off, all trials should begin and end when its minute hand is at 60, getting the true loss or gain by calculation, as already described. When the variation will not exceed a minute or two, either way from the 60, it can be regulated the same as other watches,—always remembering, however, to set and compare time only when the minute hand is near the 60 or XII, as directed for other cases of imperfect dials, etc., (202).

(733) *Proper Strength of Mainspring.*—Another correspondent inquires "What is the proper strength of mainspring for any particular watch? And, supposing that he had an adjusting-rod to ascertain the strength of a spring, how would he know whether it was suitable for the watch?" That is easily told. A mainspring is used to furnish power, to propel the train and keep the escapement in motion. A roughly-fitted, hard-running movement evidently needs more power than an easily running one of the same kind. A hard-running movement may require so much power to keep it going properly, as to be liable to injure the acting parts. Nevertheless, if it cannot be made to run more smoothly and easily, either from faulty construction, or from being of too low grade to pay for wasting time in improving it, the spring must be strong enough to run it. The excessive strength of mainspring will only be on a par with the other defects, and is a necessary evil, under the circumstances. The watch must go, while it lasts, even if it is incapable of keeping time.

(734) But with a good movement, which we have cleaned, put in complete order, and set up properly, as just described, we want that strength of spring which will be sure to keep it going in all circumstances, and give the balance sufficient vibration to enable it to perform its functions as the moderator or regulator. More than this will increase the frictions, cause the acting parts to wear too rapidly and make over-running, etc., more liable to occur in carrying. Less will fail to keep the watch going in cold weather, when the oil becomes thick, gummy, dirty, etc. The main question, then, is what extent of vibration is most desirable, to insure the best action of all the parts of the escapement, the overcoming of various obstructions and resistances to the movement of the train, etc.? This has already been answered, in the articles on the different escapements, being about ¾ turn for the cylinder, 1 turn for the lever and duplex, and 1 to 1¼ turns for the chronometer. In a well proportioned cylinder or duplex, the vibration will or should be about the same at the end of the 24 hours' running. But that is not the case with the going-barrel anker. The vibrations will of course be smaller. But, at the lowest point, as already stated, (725,) it must be large enough to make it certain that the watch will go and keep time, even after allowing for the future effects of old and dirty oil, etc. If the motion of the balance is ample when wound up, but not sufficient for safety when tested as in (725), then the strength of that spring changes too rapidly with the different stages of the winding, and either the spring should be keyed up differently, (709, 711,) to secure a more nearly uniform strength, or another spring must be fitted which will give the required action, and which will be strong enough to produce the proper extent of balance vibration. The above is the general rule, but is subject to modification in practice, in order to meet peculiarities in the adjustment for isochronism.

(735) M. Saunier has suggested, in his *Traité d' Horlogerie Moderne*, a different method of ascertaining the suitability of the mainspring for the train and the balance, by observing the rapidity with which the balance increases its motion, from the state of rest till it reaches its full extent of vibration. If the balance takes up its motion too rapidly, the spring is too stiff; if too slowly, it is too weak. Wind the mainspring entirely up, and, after it has settled to its normal vibration, notice a point which an arm of the balance reaches at the end of its swing. Stop the balance, place it with the ruby pin in the line of centers, (or as it will be when at a free rest,) let it start, and count the the number of vibrations it makes before attaining its full motion. Again stop the balance, and try it, as before, thus making three or four trials, to get the average number. In the cylinder escapement, this test is very satisfactory, and the balance should acquire its full motion in from 14 to 16 double vibrations,—only counting those in one direction. If it does so in a less number of vibrations, the spring is too stiff; if not so soon, it is not stiff enough for that train, escapement and weight of balance.

(736) But in an anker watch, a spring which would give the balance its full motion in that number of vibrations would be altogether too stiff, as it should require from 25 to 40, varying with the construction of both the train and the escapement. But this test is not altogether satisfactory, with the anker. The balance will take up the largest portion of its vibration quite regularly, till a certain point, where it will seem to halt, and from thence increase more slowly,—sometimes attaining its full arc in 5 to 10 more vibrations; at others, requiring 20, 50, or 70, or even not attaining it all till after the lapse of some minutes. This arises from the variations in the normal extent of the vibrations, caused by the irregularities in the depthings, etc., spoken of in section (273, 724), which may manifest themselves during one trial and not in another. A chief cause of this variation is the action of the main wheel teeth in the center pinion, (724). But, with a perfect movement, this method of testing would be useful, if the proper number of vibrations was once ascertained and tabu-

lated, for each grade and style of construction, which, in the anker are very numerous. The trials for this purpose should of course be made with movements of such quality as would entitle their performance to be taken as the standard, and with numerous specimens of each construction, in order to obtain a trustworthy average number of vibrations required for each, when well made, clean and in good order. In the absence of such tables, the rule should be to first get the movement in as perfect condition as practicable, and then use a spring stiff enough to give the proper vibration, (734) or as near to it as possible.

(737) A custom, based on about the same principle, is generally followed, consisting in pressing with the tweezers against an arm of the center wheel, near the rim, after getting the movement together as in section (721), but before winding, and noticing how large a vibration a reasonable pressure gives. This is merely a rough test, but experience enables the workman to tell by it whether the watch will perform well with a light spring, or one of medium strength, or will require a very stiff one,—according to the pressure required to get a satisfactory vibration, (734). If the spring, when wound up, does not give that vibration, or gives too large a vibration, it is of course too weak, or too stiff. respectively, for that movement. The test is not so much to ascertain the strength of spring which the movement requires, as whether it will perform well with that strength of spring which such a movement properly ought to have. And in case of a vibration too small, it indicates whether the real fault is a hard-running movement, or a spring too weak. If the former cannot be remedied, the spring must be stiffer, (733).

(738) *Lowering the Barrel.*—Another correspondent asks if it is not "permissable to lower the going-barrel, with a solid-ratchet arbor, by springing the center of the main wheel bridge down, at each end, where the thin part joins the feet, soles or bases of the bridge?" To this it must be replied that bending any bridge is certainly not good workmanship, and although a "cheap and quick way of lowering the barrel," when it succeeds, in case of an accident it will prove very far from being either cheap or quick, by the time damages are repaired. In the first place, being bent down from both sides, the strain will come chiefly at the center and weakest part, which may be cracked or even broken through the notch for the click, especially if the back wall of the ratchet sink is thick and unyielding. If so sprung down while the ratchet cover is screwed in place, it is also likely to tear loose some or all of its screws. But, supposing this not to occur, it is evident that the ratchet wheel will be supported, underneath, only by the teeth on the two sides,—the bottom of the sink being sprung down, away from it, at the center. The points of the teeth will soon cut into the metal, letting the wheel down, when it will be loose under the cover or bar, and the barrel will "cant over." If it has a spring click, the point is almost certain to be twisted up or down away from the ratchet, at least far enough to prevent it working properly in the teeth. This category of evils would seem to be long enough to discredit the operation, but it may be said further, that the inexperienced workman, who alone would be likely to adopt such a makeshift for a good job, will undoubtedly have to bend the parts down, and up again, several times, before getting them where he wants them, and even if the surface of the bridge does not show unmistakable marks of botching, the bother and loss of time experienced in doing a poor job ought to convince him that short cuts and "scamping" in watch work do not pay, but that a good, thorough, honest job will be not only more satisfactory to him, but more quickly and easily done by any one who is qualified to do it at all.

New Alloys.

MESSRS MEIFFREN & CO., of Marseilles, France, have recently produced several beautiful alloys, applicable as substitutes for gold and silver in the manufacture of jewelry, etc.

To make an alloy having the color and appearance of gold, they place in a crucible copper as pure as possible, platinum, and tungstic acid in the proportions below stated, and when the metals are completely melted they stir and granulate them by running them into water containing 500 grammes of slaked lime and 500 grammes of carbonate of potash for every cubic meter of water. This mixture, dissolved in water, has the property of rendering the alloy still purer.

They then collect the granulated metal, dry it, and after having remelted in a crucible, they add a certain quantity of fine gold in the proportions hereinafter specified. An alloy is thus produced which, when run into ingots, presents the appearance of red gold of the standard $\frac{750}{1000}$, and to which may be applied the name of "aphthite" or unalterable.

They can change the color of the alloy by varying the proportions of the different metals. As flux they use boric acid, nitrate of soda, and chloride of sodium, previously melted together in equal proportions. The proportion of flux to be employed is 25 grammes per kilogramme of the alloy. The proportions they employ, by preference, for producing an alloy of red gold color are: Copper, 800 grammes; platinum, 25; tungstic acid, 10; and gold, 170 grammes.

The alloy used in imitation of silver consists of iron, 65 parts; nickel, 23 parts; tungsten, 4 parts; aluminum, 5 parts; and copper, 5 parts. The iron and tungsten are melted together and then granulated, as in the case of the previous alloy, except that in this instance the water into which the mixture is run contains one kilogramme of slaked lime and one of carbonate of potash per cubic meter.

The nickel, copper, and aluminum are also melted together and granulated by running into water containing the same proportions of lime and potash. Care should be taken during the melting to cover the metals contained in the two crucibles with a flux composed of one part of boric acid to one part of nitrate of potash or niter.

In the crucible containing the aluminum and copper they place a lump of sodium of about two grammes in weight when treating five kilogrammes of the the three metals (nickel, copper and aluminum) together to prevent oxidation of the aluminum, and they also add charcoal to prevent oxidation of the copper.

Before granulating the metal in each crucible, it should be well stirred with a fire-clay stirrer. The granulated metals are dried, as in the former case, then melted together in the same crucible in the same proportions above indicated, and well stirred, after which the alloy is run into ingots.

The alloy thus obtained, to which may be given the name of "siderapthite," (or unchangeable iron), presents the same white appearance as platinum or silver, and is not more expensive than German silver. These improved metallic alloys are capable of resisting the action of sulphureted hydrogen, are unattacked by vegetable acids, and but slightly attacked by mineral acids; they are also perfectly ductile and malleable.

Fitting Balance Staffs

IN the latter part of the 3d chapter of "Grossman's Treatise" there is described a balance-staff that is a plain arbor without collet or shoulders for hair-spring or balance, the spring collet fitting to a part of the balance, and the staff fitting tightly into a long small hole through the balance. The advantage to be derived from this plan is in being enabled to adjust the height af the balance, especially in English watches, as this staff can be driven either way. This plan is only applicable when a new balance is to be made. The same advantages can be obtained by the repairer in replacing a broken staff only. Fit a piece of brass wire, large enough to make the staff collet, into the drill chuck, or in any other manner to the lathe; turn the socket for the spring collet, also for the balance, and fasten the balance on with a burnisher, before removing rrom the lathe. Drill the hole the size of the staff, and cut the collet from the lathe with a fine saw, The staff is but a straight arbor fitted tightly into this hole. Besides the advantages of making little alterations in the height of the balance, this staff is easier to fit, even the ffrst time, than she very goor ones sold by the shops; and if ever broken again, it is only necessary to fit the straight arbor. As good steel as any for this purpose is a sewing needle of the right size, the temper drawn to a deep blue.

Precious Stones and Gems.

BY EDWIN W. STREETER.

SMALL crystals are found loose, or embedded in granular limestone. Colors: carmine, carmoisine, cochineal, rose-red, to reddish-white, cherry-juice, hyacynth, and brownish-red, reddish-brown, yellowish-brown, and orange-color. It is transparent, translucent, and receives its red tinge from chromic acid.

It is found loose in the sand in the province of Mysore, in the Madras Presidency, and in Hindostan; but in Burmah, Pegu, Ceylon, Saffragan, and Matura, in well-formed, sharp-angled, and, for the most part, octahedral crystal. It is also found in the sands of rivers and in inundated lands, accompanied by Zircon, Garnet, and magnetic iron ore; and in granite, accompanied by Apatite.

North America.—In the region between Amity and Andover there is much granular limestone and serpentine in which Spinel abounds. Sometimes the crystals are as much as sixteen inches in diameter.

The Spinel-crystal belongs to the regular gem system, and its form has the octahedron for its base. Spinel is found in fragments or pebbles. Twin crystals frequently occur. It is distinguished from the Ruby by its peculiar formation and inferior hardness. Cleavage—very imperfect and parallel to the facets of the base; hardness—that of Topaz; specific gravity—3·5 to 3·8.

A peculiarity of Spinel is that the light which is reflected from the depth of the gem, no matter what the color of the stone, is always of a pale yellow. The lustre is vitreous, and displays every degree of transparency. The refraction is simple, and in no stone is this more real and abiding than in this species. It is rendered electric by friction, but not by heat.

Spinel is a combination of alumina and magnesia. The varieties of color are due to the magnesia being replaced partially by iron oxide (Fe.O), zinc oxide (Zn.O), or manganese oxide (Mg.O) and lime (Ca.O); and the alumina, by ferric oxide ($Fe^2.O^3$).

One of the finest specimens of Blue Spinel, a thickish oblong stone, was in the possession of Messrs. Pittar, Leverson & Co., a short time ago. It was an Indian-cut stone, weighing 31⅞ carats. They had it re-cut by Mr. J. N. Foster, of London, and it weighed after re-cutting 25 carats. There is a curious history attached to this stone; it was consigned from India as a Sapphire; subsequently it was found to be a Spinel, whereupon the purchaser returned it to the merchant, who at once wrote to the consignor in India, but the statement was not believed. The merchant determined to have it cut, and afterwards sold it for a much larger sum than it had obtained as a Sapphire.

In the Exhibition of 1862, we find there were two very fine Spinels; one exhibited by Messrs. Hunt & Roskell, which, when it arrived from India, was a cabochon-cut, octagon-shaped stone, of perfect color, and free from flaws. It weighed 196 carats. This also was cut by Mr. J. N. Foster, to an 81 carat "perfection stone." The other Spinel was also an octagon-shaped stone, of perfect color, very "spread," and free from flaws. It weighed 102¼ carats, and was re-cut to 72½ carats. It is strange that both these stones arrived from India in the same year, viz., 1861. One collected by Dr. Heron is said to weigh 49lbs.; it is in three pieces, and contains cavities studded with crystals of Corundum.

Europe.—In Meronitz, in Bohemia, little rose-red crystals are found, in company with Pyrites; also in the Liebenburgen, in gold sand. At Arker, in Sweden, pale-blue and pale-grey varieties are found in limestone.

Australia.—Crystals are found in the Ovens River, in Victoria, and also in the pearl rivers of New South Wales, and in other parts of Australasia.

In Sweden, Antwerp, and Ceylon, crystals are found both loose and imbedded. They are easily distinguished by their foliated fracture; color generally of faint-blue, violet-indigo, and seladine-green. Translucent. Contain 3 to 4 per cent of iron.

This mineral received the name of Ceylanite, from Romé d' l'Isle, who analyzed it with a number of others, brought from Ceylon. Haüy, seeing that its crystal was like that of Spinel, desired to give it a special position in the system of minerals, and named it *Pleonaste*, which signifies superfluity. Further investigation showed that it was in reality a black variety of the Spinel.

The specific gravity of this stone rises from 3·5 to 3·8. It consists principally of alumina, and about 10 per cent. of protoxide of iron. Its infusibility before the blow-pipe, and its formation with borax into an iron-colored glass, are the surest indications of Pleonaste. Acids have but little influence upon it. It is found in Russia and other cold countries, but it is also found in Ceylon, as well as in the Dolomite region in Ratan.

Spinel, in consequence of its lustre, color, and hardness, is used for personal ornament, and for objects of luxury; but it is only when the crystals are fine and large that they are considered gems. In cutting it receives the same form as the Ruby.

Spinel Ruby or Balas Ruby varies in value according to its cut and color.

In the inventory of the French Crown Jewels, in the year 1791, we find the following:

One Spinel Ruby of	56¾ carats	- - - -	50,000	francs.
One "	42-5 "	- - - -	300	"
One "	3¾ "	- - - -	200	"
One Balas Ruby of	20⅜ "	- - - -	10,000	"
One "	12⅜ "	- - - -	3,000	"

These gems are pale-red, or rose-red, with a tinge of blue appearing at the angles of the octahedron, which gives them a milky kind of shimmer and depreciates their value. The color is due to chromic acid.

The Balas Ruby varies much in price; for example, a dark rose-red of 10 millimetres, square-cut, and polished as a Brillant, pure and lustrous, will sell for 300 francs; while a pale-rose of like size, will be worth 20 francs only; its value depends entirely on the demand and the character of the stone, occasionally a fine specimen of five carats will realize £50.

As long ago as the last half of the 13th century, Marco Polo collected them in Balascia or Ballahia, on the Upper Oxus, where they were found below the surface soil.

The Opal is a non-crystalline, compact body, having a vitreous, which often inclines to resinous, or to pearly lustre. Its hardness is 5·5 to 6. The specific gravity is only 2 to 2·1, which is attributable in some cases, to accidental cavities in the stone, which are sometimes filled with drops of water. Although possessing no color which can properly be called its own, it exhibits flashes of the most brilliant colors: this is the result of the number of fissures which traverse it, and which are filled with air and moisture. It is composed of 90 per cent. of silica and 10 per cent. water. When first taken out of the earth it is soft, but it hardens by exposure to the air. Before the blow-pipe the Opal is infusible, but the water driven out by heat renders it opaque. It has the curious property of improving by wear, as warmth brings out the brilliant tints for which the Opal is famed.

Nicols gives a quaint description of this stone. He says, "The Opal is a Precious Stone which hath in it the bright, fiery flame of the Carbuncle, the fine, refulgent purple of an Amethist, and a whole sea of the Emerald's green glory; and every one of them shining with an incredible mixture and very much pleasure." Boetus says, "that it is the fairest and most pleasing of all other jewels, by reason of its various colors." Cardanus says, "I bought one for 15 crowns, which gave me as much pleasure as a Diamond of 500 aureos." Onomacritus, writing 500 years B. C., says, "The delicate color and tenderness of the Opal reminds me of a loving and beautiful child." Pliny says, "It is made up of the glories of the most precious gems, and to describe it is a matter of inexpressible difficulty."

The precious Opal, used in *bijouterie*, is found almost entirely in Hungary. It was called Oriental Opal by the Greek and Turkish merchants, who obtained it from the celebrated mines of Czerwenitz

and carried it to the East for the purpose of giving the title of Oriental to it, which always conveyed a sense of goodness and value to stones. If it were necessary to prove that Opal does not exist in India we could state that Dhuleep Singh, on revisiting that Empire, carried two Opals to his mother as a gift that should bear the charm of novelty.

The mountain range in Hungary, were the Opal is found, consist of a kind of porphyry, which likewise yields lead, silver, and gold; and near the celebrated Czerwenitz district traces of quicksilver also occur. The two highest mountains of this range are Simonka and Libanka, and it is from these that the precious Opal comes, and observation leaves no doubt that the Opal mass, originally in a liquid condition, filled up the cavities in the porphyryveins and gradually solidified. This stone is found in Honduras, Zimapan, Mexico, and Brazil. It also occurs in thin slabs in Queensland, and it has recently been discovered in other parts of Australia in large blocks. Opals are found at Sandy Brae, in Ireland, in porphyry, though not in specimens worthy of cutting; also in several parts of Denmark, and in Frankfort, embedded in dolerite. In South Australia the Opal in its play of color is similar to that of Hungary.

The Opal is cut and polished first upon a leaden plate covered with Emery, next on a wooden wheel with fine pumice powder, and lastly on a wheel covered with felt. Delicate handling is requisite to turn out an Opal to the best advantage.

The work of engraving the Opal requires great care on account of the numberless fissures, which it is dangerous to open to the air, yet there are several engraved Opals in existence. The oldest example is an Intaglio, on a moderately large Opal, of the portrait of Louis XIII. when he was a child; and the head of Juba is engraved upon an Opal in the collection of the Duke of Orleans.

The Hungarian Opals exhibit a uniform milkiness of surface, more or less iridescent. From their greater density, they resist the effects of wear longer than any other sort, hence their superior value. The Mexican stones are beautiful, but so porous, that if they are wetted they become colorless, or after some wear they become opaque and brown; they are only worth a few pence a carat. A few years ago Hungarian Opals were sold by the piece, now they are sold by the carat: (1) the smaller stones, £1 to £1 10s. per carat; (2) medium ones, £2 to £3; (3) larger stones, £3 to £5; specimens of great size and purity, on account of their extreme rarity, are well-nigh invaluable.

There is a peculiar history connected with an Opal about the size of a hazel-nut, which Pliny gives. This particular Opal was possessed by Nonius, and was valued at $100,000 of our money. Nonius, who was proscribed by Marc Antony for the sake of this gem, made his escape, carrying off the ring with him, as the sole relic of his fortune. He preferred exile with his Opal to living in Rome without it.

The two largest specimens of "Fire Opal" known in this country, were found in the Hungarian mines in 1866; and were exhibited by the late Madame Goldschmidt in the Paris International Exhibition of 1867. Both stones are the "drop," or pearl-shape form, one weighing 186 carats, the other 160 carats; this latter, a magnificent 'Harlequin Opal," is reputed on good authority, to be the finest gem of its class ever seen.

There is, in the Imperial Cabinet of Vienna, an Opal nearly as large as a man's fist, and weighing 17 ozs. Perhaps the finest Opal of modern times was that of the Empress Josephine, which was called the "Burning of Troy," from the numberless red flames blazing on its surface, the obverse being opaque, which is one of the forms of the Honduras Opal.

There are innumerable superstitions surrounding these gems. By the Ancients they were thought to bestow every possible good. In the middle ages the same belief was held; and in the early part of the seventeenth century the Opal was much more valued than in the present day. By a strange streak of fashion, the Opal has lost its pristine glory, and is now falsely accused of bringing ill-luck. Sir Walter Scott is in a great measure answerable for this, as readers of *Anna of Geierstein* well know. It seems strange that in this enlightened nineteenth century, there should still be people believing in the bad fortune supposed attendant on the wearing of Opals. Yet withal it is a favorite stone with the Queen, and with the members of most of the European royal families; and without doubt the stone will, ere long, be as much appreciated as it was in earlier times. It is inevitable that the idea of ill-fortune at ending the wearing of the Opal, should go the way of all superstitions.

The Black Opal is a stone that has lately appeared in the market and, like anything new or uncommon, was immediately sought after. A heavy price is readily paid for it. The ordinary Opal is worth, say 60*s.* the carat if fine, but its black brother has a higher commercial value. Certainly the colors are very lovely in this Opal, yet how they acquire their blackness and deep tints is questionable. Some other hand than unassisted Nature may have been at work. Man is an adept at chemical operations. I may be wrong, and no doubt Baron Goldschmidt, the owner of the Hungarian mines, would say so; but still it is well to have an opinion based on experience. A specimen of the size of a hen's egg, was not long since sold in Paris for 25,000 francs. I have one in my possession of similar size, and the colors are certainly attractive. At present these stones are rare.

Much confusion exist concerning the Cat's Eye, a very curious and valuable gem, a confusion arising partly from the ignorance of many in the trade as to its true nature, put principally from the mistakes of those who have written about it. In mineralogical treatises it is usually confounded with, and described as, a particular kind of Quartz, which somewhat resembles it, but which is of little or no mercantile value, although it has occasionally been sent to Europe by unscrupulous merchants as the true Cat's Eye. This *chatoyant* Quartz is found in Ceylon (also in the home of the true Cat's Eye) in large quantities, and occurs chiefly of various shades of yellow, or brown. It is semi-transparent, and when cut in a convex form (*en cabochon*) shows a more or less defined band of light, with a *silky* lustre, resulting from a reflection of the fibrous-like grain of the stone itself, or more probably from an intimate admixture of asbestos. This Quartz Cat's Eye, even when most perfect, cannot be compared for beauty with the real Cat's Eye, for which it would not be mistaken, even by the uninitiated. It is at once distinguished by its inferior hardness, and want of brilliancy.

Description of True (Chrysoberyl) Cat's Eye.	*Description of Quartz Cat's Eye,*
Color—Various shades of yellow, brown, and green, rarely black.	Color—Various shades of yellow and brown only.
Ray—Iridescent.	Ray—Dull.
Polish—Brilliant.	Polish—Dull.
Hardness—8·5.	Hardess—6 to 6·5.
Specific gravity—3·8.	Specific gravity—2·65.
Infusible and not affected by Acids.	Melts with Soda to clear glass. Soluble in Fluoric Acid.
Sometimes showing a beautiful trichroism.	Never trichroic.
Chem. Com. { 80 alumina, 20 glucina, coloring matter —protoxide of iron.	Chem. Com. { 48 silicium, 51 oxygen, with a small amount of oxide of iron and lime.

The true Cat's Eye is a rare variety of the Chrysoberyl, of extreme hardness (in this respect being only inferior to the Diamond and the Sapphire), and is characterized by possessing a remarkable play of light in a certain direction, resulting it is supposed from a peculiarity in its crystalization. This ray of light, or "line," as it is improperly termed by jewelers, shines in fine and well-polished specimens with a phosphorescent lustre.

Proceedings of the Horological Club.

A Distinguished Body of Watch and Clock Makers.

Fifty-eighth Discussion.—Communicated by the Secretary.

[Notice.— Correspondents should write all letters intended for the Club separate from any other business matters, and headed "Secretary of the Horological Club." Direct the envelope to D. H. Hopkinson, Esq. *Write only on one side of the paper*, mail as early as possible, as it must be received here *not later* than two days before the end of the month in order to be discussed and reported in the Circular for the next month.]

CLEANING PEARL JEWELRY.

Secretary of the Horological Club :

Will some member of your distinguished body please inform me of the best way to clean pure *pearl jewelry?* F. W. B.

In the absence of Mr. Lapidary, Mr. McFuzee replied that his way was to wash it with pure soap and water, with a stiff brush, then drop in 98 per cent alcohol, and dry off in boxwood sawdust as usual. No cyinide of potassium, ammonia, or other cleaning substances should be used with the soap and water, as they would be likely to injure the pearls. If washing was not sufficient to clean up the jewelry properly, it must be dipped in acid solution, or similar preparations, to brighten the gold, as they would infallibly destroy the pearl. The tarnish should be scoured off with rouge and a polishing brush or buff, then washed clean and dried as first mentioned.

RECOMMENDING POISONOUS CHEMICALS.

Secretary of the Horological Club :

I desire to call the attention of the Club, and through them of the trade, to the danger of recommending any chemicals for mechanical or other uses without telling their properties. For example, I have seen cyanide of potassium recommended in the Circular, several times, for certain purposes. Many to whose notice it comes might not happen to know that it is poisonous at all. I think very few of our practical workmen know much about chemistry. It is deadly poison taken internally, ukdangerous to inhale to much extent, and should not come in contact with broken ctin. The United States dispensary (an authority) styles it "pre-eminently poisonous." I knew it to be poison, but did not think about inhaling it until I had (as I shink) received serious injury to my lungs from it. I have banished it, to recall and use only with extreme caution. It is very easy for those knowing the dangers or objectionable properties of anything to mention them, and those *not knowing* ought to keep quiet about them until they find out. W. B. S.

Mr. Electrode said that it was unquestionably advisable to describe the dangers attending the use of any new chemicals or processes recommended. But in the case of cyanide of potassium, it had been so frequently described as poisonous that almost everybody ought to know it by this time. Besides, it was not nearly so injurious to some as to others. The speaker said that he could work with his hands in it almost constantly for days together, inhaling it all the time, and even swallowing more or less of it, left in the mouth after tasting solutions, without the slightest inconvenience,—while to some, even the smell of it would give violent headache, cause vomiting, etc. As a rule, this and all other chemicals that the workman is not acquainted with, from previous use, should be used very cautiously, as Mr. S. advises,—for it is much easier and better to be careful and avoid injury, than to suffer the consequences of carelessness and recover from their effects.

A BUSINESS FIRM ARRAIGNED.

Secretary of the Horological Club :

I have written two letters in answer to an advertisement in the Jewelers' Circular for separable sleeve buttons, and I want to know if it is either business-like or gentlemanly not to reply to my letters? The first one I wrote was simply to ask for a price list, and I enclosed my card so that the firm I addressed would know they were dealing with the trade. The second letter I wrote requested also a price list, but I added that if they did not deal directly with the retail trade to please furnish me with the names and addresses of the agents who could furnish them. What I would wish to ask your honored body is what more can I do that I have not done in order to obtain a reply from said manufacturers?

I am positive that I sent my full address; that I addressed my letter in strict accordance with the advertisement, and that I enclosed a stamp for return postage.

Looking for an answer, I remain yours truly, Enquirer.

Mr. Clerkenwell thought it rather strange that Enquirer's letters had not been noticed at all, under the circumstances stated. It was cerainly business courtesy to reply in such cases. But from his knowledge of the firm, he was confident that there must have been msoe failure in the mails. Perhaps they had replied but had failed to put on stamps enough to pay the postage to Nova Scotia, or from some other reason the letters had failed to connect, or been stopped, or missent. It could hardly be the ease that they had not thought it worth while to send circulars off so far, for ordinary decency would require a reply when a stamp was enclosed, and he had always found the firm very courteous and accommodating. What the explanation of the mystery was, he could not imagine, nor could he see that anything further was required to entitle Enquirer to an answer and an apology. Perhaps, if he would write to them, calling attention to this notice, it would bring him some solution of the puzzle.

FITTING BALANCE STAFFS WITHOUT WAX.

Secretary of the Horological Club :

I am as well aware as any one that a *brass collar* upon a staff in an American or Swiss lever watch is entirely out of place and unworkmanlike, but if Mr. Waltham will again read that article by G. L. S., as published in the November Circular, he will see that he does not say anything about putting a brass collar upon the staff. He simply uses the piece of brass in place of the wax for turning the staff. He turns the lower part of the staff and gets it to the roller table, finishes the lower pivot and then removes it from the chuck, inserts a piece of brass wire, trues its centers and drills a hole that will receive the part of the staff that is finished, tight enough to hold it firmly, and then turns the upper part of the staff, fitting it to the balance and hair spring collet, and turns the upper pivot and polishes it, and then removes it from the brass he has used instead of wax, and he has a finished *steel staff* which, if the job is reasonably well done, is as perfect and true as can be done by wax. It may be an old method, but it is entirely different from that which Mr. Waltham has described it to be, and so severely criticised.

Mr. Waltham acknowledged that, on hearing Mr. J 's previous letter read before the club, he had misapprehended the nature of the process, supposing it to be the "cheap way" of fitting balance staffs with brass collets on them. He was glad that Mr. J. had corrected this mistake, for the idea, as now explained more fully, seemed to be a good one, and if well done he saw no reason why it would not produce a good job. He would judge that the wire should be of pretty hard brass, and that the staff should not fit in the hole quite up to the shoulder or collet, so that, if removed often and become a little loose, it could go no further in the hole and be tight. He also thought that, inasmuch as considerable force was required in turning down the collet for the balance and hair-spring, which was liable to loosen the staff in the brass, or enlarge the hole, it might perhaps be well to turn them down roughly on the steel before fitting it in the brass at all. This could easily be done, after finishing the lower end of the staff as described, and before cutting it off the steel wire from which it was made. But if the staff was bought already cut nearly to length, that could not be done for the upper end must of course be held in the chuck while turning the lower one. It could be rough turned, however, before putting it in the chuck to finish the bottom end, then the staff reversed as Mr. J. describes, and the top finished.

Mr. Horologer said that the method of turning staffs from the wire mentioned by Mr. Waltham, reminded him of another one often followed, called "hubbing." By that method, a suitable piece of wire was fastened firmly in the chuck, the lower part finished, pivot and all, the collet turned down, all the upper shoulders and the upper pivot itself turned out and polished up before cutting the staff off or removing the wire from the chuck. While the upper pivot was being turned down, the lower or outer end of the staff was supported by a peculiar device, of cutting a supporting socket for itself in the back center. A center, fitted in the tail stock had a brass or copper tube slipped on it far enough to be firm, which was then filled with ordinary soft solder, which was melted in it, and the open outer end filed off level and flat. This center was carefully pressed up against the finished bottom pivot, well oiled, while the lathe is running, and the pivot and shoulder bed themselves in the solder, which forms a perfectly true support, even if the lathe spindle is not quite true with the center in the tail stock. It is also firm enough to prevent the outer end of the staff from moving or trembling, and protects the upper pivot from being strained while forming and polishing it. Of course, all this could not be done without good measuring tools and knowing how to use them, sharp gravers and polishing slips adapted to the work. But, with these requisites, it was an extremely expeditious method. He had actually seen a complete balance staff turned from the wire, with fine conical pivots and oil stops, with all the parts fitted to length and size, and all finely finished and polished, *in sixteen minutes*,—with the exception of finishing the end of the top pivot where it was shut off; that was not done till after trying in the watch. Perhaps somebody has done it in less time, but he had never heard of it.

Mr. Isochronal had no doubt it was a very quick way, but he found the tendency with the majority of workmen would be to do the job as quickly as possible, and neglect fitting as closely as might be done. He deprecated any commendation of fast working, but make the first and chief duty of the workman to do the job as *well* as he could, and to take whatever time might be required to do it so. If he could do it well *and* quickly, very good; but it should be done well, whether done quickly or not. It was of the utmost importance to train the workman to correct ways of working. After becoming used to them; experience would bring speed.

NEW YORK PRICE LISTS.

Secretary of the Horological Club :

Amaltheia desires to exonerate Mr. Clerkenwell from intended personality in the discussion of price lists. There is no personal "unpleasantness," only a slight objection to the misrepresentation of principle involved by the reflection of Mr. C.'s former remarks which, after all said, (including the speaker's solution of the ques-

tion) still remains the same. I would ask if Mr. C.'s supposed case of scapegoat making (Aug. CIRCULAR, page 126) is not a clear case of individual price list making instead? "A rival across the street" playing the villain with a neighbor's individual price list is one feature of that regulate-your-own-price-at-random doctrine which I am opposing. Certainly that supposed case bears no parallel to the principle involved in Amaltheia's suggested approximate equitable list, as eminating from the Metropolis, for which no personally known individuals could be either censured or commended if published under sanction of the Club, as a trade guide to equitable charges. In order to compare cases I will quote from Mr. C. on the objectionable principle of the Amaltheia list, viz., "Does Mr. A. suppose that city workmen wish to furnish their prices for the purpose of enabling their country brethren to show them and "cut under?" The speaker endorsed this view, and as requiring "fancy prices to give a chance for *cutting under*," which in his "opinion is not the correct way of doing business." To accomplish my comparison permit me to offer, not a *supposed* case, but one of actual occurrence; an instance of the many like, constantly transpiring in the order of circumstances, viz: A shrewd merchant of our little city stepped into a *first-class* establishment in your city, and was charged three dollars by the gentlemanly accountant for putting a mainspring in *a fine* S. W. movement. The merchant paid the bill without dissent, regarding it a legitimate charge, made so by the local demands of business there, knowing that if he would do without the service of his watch till at home again, he could get it done every whit as well for *one-third less*. Is this "cutting under?" Or is it a consequence of the local influences so widely different? If this is the spot where the bug bites our city brethren we can't help it. In honor and justice to them we maintain that the difference in charges is legitimate. Any other grounds would argue to dissolve our business relations and destroy commerce. To be more explicit. If I should charge that same merchant three dollars for putting a mainspring in the same watch, he would promptly inform me that he would not pay New York prices here. But if I should exhibit a New York trade price list as the standard guide from which to deduce a charge of "one-third less," he would see at once that the charge was reasonable and legitimate. In our rural simplicity with little perceptible acumen, we utterly fail to see "ary" ghost of a scapegoat as a result. Meanwhile the principles we vindicate we must maintain, but we don't mean to say the Horological Club *must* get out a price list. Amaltheia does not need a list; the suggestion was offered in accordance with the principles set forth, not as a *personal* want, but a means to harmonize, in its tendency, the discordant, antagonistic, petty, envious, self-destructive spirit of our retail trade repair shops. This hydra-headed green-eyed spirit needs to be brought under control of some centralizing influence that will cause the craft to realize that it has an interest and a power in concert of action as a trade. Although every industry of the country, ours excepted, represent themselves in general convention, the advantages of which need no comment—hardware merchants, grocers, jockeys, dry goods dealers, gift enterprises, etc., can all buy watches as cheap as the skillful judge of watch mechanism. The former incur no after responsibilities in their retail sales. Can we compete successfully at variance with each other.

AMALTHEIA.

Mr. Clerkenwell acknowledged that Amaltheia stated his side of the case well and strongly, but he could not agree with him as to the effect of the plan proposed. Mr. A. thinks that a list of New York prices would cure the practise of each one making his own prices. But what is the difference, in reality, whether a man knocks one-third off from a city list, or arranges a rate of charges from his own knowledge of the charges of others? In both cases, we will suppose that he puts the rates at what he thinks a fair pitch—the only difference being that in the former he has a list which he can *show* the customer that his prices are lower than somebody else's, which in the former he only gives his word that it is so. Again, Mr. A. proposes to put his prices at one-third less than those on the city price list. Others might think 40, 45, or 50 *per cent.* off would be better. What is to prevent each man from knocking off what *he* thinks is right? And how will the list secure uniformity, and cure the "independent price-list making?"

How will it hurt the botches? Mr. A tells a man "I discount one-third off from the city prices." A rival says he will knock off 50 *per cent.*. The botch says, "Mr. A, B and C charge one-third or one-half off this price list. I will do it just as well, for 60 or 65 *per cent.* off, and warrant it." How much better off is Mr. A, or the public? Customers will not only be just as badly bewildered about prices as now, but, in addition, they will be convinced that these city watchmakers must be a lot of vampires and swindlers, to charge such prices, when the work can be done just as well for one-half or one-quarter of the money. Net result:—No good done to anybody, but the city workmen advertised by their country brethren as extortionate, etc. Would the former be making scapegoats of themselves by favoring such a scheme, or would they not?

There is, and must be, as Mr. A. says, a difference in the prices charged in the city and in the country, and even customers can see the propriety of it. But the point that sticks in Mr. A's crop is calling that "cutting under." That depends on circumstances. If Mr. A. charges $2 for a mainspring, that is not cutting under anything or anybody. But if he shows a list on which the prices given is $3, or speaks of somebody else charging $3, and that *he* only charges $2, that may fairly be called "cutting under." Or, if the well-established price in that vicinity was $2.50, and he should put his regular price at $2, that would be "cutting under." If not, what would be? But that does not matter. The difference between Mr. A. and the speaker, is that Mr. A. thinks that a city price-list would secure uniform charges in country shops, at least, in the same place, while the speaker thought it would not have that effect at all.

But as to the need of *some* method of preventing dealers from cutting their own throats to spite their rivals, we can all agree. The question is *how* can we bring the trade into such concert of action, and under some central influence and control. During the centennial year, it was proposed to have a national convention of watchmakers, at Philadelphia or New York, but they were too indifferent to do anything about it, although it would have been comparatively easy then for a large number to meet at some specified time and place. That was the fault of the trade, an indisposition to do anything *themselves*, but look to *somebody else* to correct abuses and evils, and bring about desirable reforms. As has been remarked at a previous meeting, dealers would supinely look on while outsiders and botches, the common enemies of all, dug graves for them, and would suffer themselves to be tumbled in and covered over, rather than arouse themselves and make some effort at exterminating obnoxious customs and firms. He could not suggest any remedy, for those who would not try to help themselves, could not be helped. The only hope for a change was for each one to resolutely do all *he* could to make things better, whether others did or not. But at present the men who, like Mr. A., are willing to exert themselves for the general good, are too few to yield much prospect of success. After the trade has been cornered, and crowded out, and abused and starved enough by competitors, we might look for a little proper resentment and resistance. But thus far they seem more disposed to offer the other check, than the toe of the boot, to their foes.

THE HOROLOGICAL SCHOOL—THE BOTCHES—REMOVING SET JEWELS—FITTING BALANCE STAFFS.

Secretary of the Horological Club:

I have a few suggestions which may be worth putting on paper, touching several of the subjects which have been discussed by the Club, about the Horological School, which has been in my thoughts for several years. I have always had an idea that it might be connected as one of the branches in some of the central technological schools, the instruction of the theoretical being much the same as in general mechanics. The objection might be the difficulty of getting work and repairing, for the practical department, but it seems to me that arrangements might be made to have work from the trade, as well as if in a separate institute. One advantage of this plan, if practicable, would be that a boy would expect to complete his studies as if he were pursuing a regular collegiate course. The difficulty, however, seems to be to obtain the "Head." On this point I cannot suggest, my personal acquaintance with leading workmen being too limited. But, while Excelsior would be undoubtedly "The" man, it does not seem as if in the wide world there might be found one other to engineer the plan to a point of success.

"The botches" is a subject which seems to give considerable trouble to the Club. Well, they always will. They are like flies and mosquitos, perennial, always around the better workman to consume his substance and vex his spirit, for wherever there is room for a good workman, there is also room for an inferior one to take so much of his living. And that it is so, is due principally to the community at large. I have observed this matter for years, and been in the fight for a high standard of work and fair prices, and am forced to the conclusion that the larger part of the people will go where the price rules a little lower, and are not disposed to credit the idea that one workman does better work than another. Of course, I do not mean that a good workman cannot build up a good business, if he can stand long enough in one place to obtain a reputation, but I do think that, in proportion to the number of workmen in the country, there are comparatively few first-class men, who have had no other means of living, such as carrying a stock of goods, etc., who more than realize a fair living. And I do not think there is much opportunity for remedy. The country is filled with a poor grade of workmen, who have obtained a foothold in the community where they live, and generally they work for a price which no good man can begin to live on (for it takes time to do work well, as well as skill), and the customer notes the difference in price, and unless acquainted with, or recommended to the better man, goes to the cheapest place. Now, if he gets disgusted with the cheap work, he has paid his money once, and it becomes harder still for the better workman to get his price. The only remedy, as far as I can see, is to establish the school, and this is only partial, as there would still be a large proportion of boys who could not afford the expense. It seems to me that the diploma plan would be insufficient, except for graduates of a Horological school, as a large number of good workmen having already fought the fight, and obtained something of the prize, would care little for a diploma, except, perhaps, to help the thing along. Then how many customers are there who would look at the diploma of a physician or apothecary, to know whether he understands his business? So in watchwork, the customer judges by appearance and his pocketbook, and he that depends on his diploma for recommendation comes out in the rear.

I send you my plan for removing jewels from American watches. I take about half a length of a stick of peg-wood, and whittle it as for pegging out a hole, then cut off the end square, so that the point fits the hole in the bridge. With this I can push out a jewel fitting tightly, but, if too hard to remove, place the bridge over a hole in any stake large enough to allow the jewel to pass through, and strike the stick a smart tap with the hammer. I have followed this plan a number of years and do not recollect ever breaking a jewel, or marring it.

The communication in the November number about balance staffs turned with a brass collet, leads me to say that, in replacing English balance staffs, I use all steel, as in American or Swiss, and do not have the vexation of seeing the collet shifting on its arbor, as is often the case where brass is used. Also that, except for practice, a partly finished staff of a high quality can be obtained of the dealers best material. They are left white after tempering, and are turned nearly to size. In a gross of them one rarely fails to find a suitable staff for either American or foreign watch.

HOLMES.

Mr. Uhrmacher thought that the principal thing required in a Horological School was practical instruction. The theoretical part, or instruction in general mechanical principles, would be substantially

the same as for other mechanical operations, but that, he thought, would be easily and quickly learned, in comparison with the time required for the practical part. There was more need, however, for instructions in mechanical principles applied to horological devices and uses, such as analyzing one of the escapements, finding what principles underlie its action, and what are the conditions for the best form and operation. This sort of information would be found nowhere but in a horological institution, which would be better conducted by itself. As Mr. Holmes remarks, the great difficulty is to find the proper "head" for it—some one who, besides being competent, is known to and has the confidence of the entire trade, and will command their support and patronage by his name and influence. As Mr. H. says, Excelsior would undoubtedly be *the* man, but his business renders it impossible for him to give it the time required. There may be others who could do as well, but who? That is the question which we would all like to have answered.

With regard to the botches, we are afraid it is too much as Mr. H. remarks, and we fail to see our way clear to succeed in exterminating them. So long as people cannot know anything of the real quality of the work done for them, but judge by appearances, and go where it is done the cheapest, so long will the botch prosper, if he keeps up appearances, and has a smooth tongue and some business tact. What, then, shall we do about it? Submit to the inevitable, live on friendly terms with our botch rivals, and so practically lower ourselves to their level? By no means. Let us fight it out while life lasts, and do what we can to correct what is wrong and make things as much better as lies in our power. If all this does bear fruit pecuniarily, for us, it will for our children or successors. As long as we follow the trade, let us not degrade it, but try to make it respectable and respected.

There is one point, too often overlooked, which he wished to mention. People are influenced as much or more by their personal likings, as by their convictions of a man's qualifications. A good workman may be personally a very disagreeable man, while the botch may be a very pleasant one to deal with, have good tact, knowledge of human nature, and the faculty of getting along in the world. We should all try to please our customers, not only by good work, but by being socially agreeable, intelligent, and desirable friends and citizens. People who know nothing of the skill of different workmen will go to the one they like the best. That is a trait that will be observed everywhere and always, and we should be wise enough to profit by it, in conducting our business, and in our intercourse with the community on which we depend for patronage. If the good workman is also a popular man, he will get the cream of the trade; but if the botch has secured the favor of the public, they will give him their custom, will look leniently upon his failings, and actually stand up for him as against a better man whom they do not fancy. We should not be stiff and reserved, nor so familiar as to be trifling and silly, but pleasant, agreeable, courteous, obliging, liberal—in short, we should be first-class men, as well as first-class workmen. When we all reach that point, the botches will be blotted out, the millenium will dawn, and everything will be lovely. The great trouble is that very few of us reach it, and for our want of tact or of proper effort we suffer accordingly.

The Science of Heraldry.

THE science of heraldry enables us to explain in forms and colors the hereditary marks of honor obtained by our ancestors, for deeds of bravery or other honorable actions—to explain their descent and alliances, and also to distinguish different States, civil, military and ecclesiastical societies.

The science has fallen into disuse, but now shows some signs of revival although, however, its original intentions are not fully carried out, as it is now used as an ornament, whereas it was at one time a necessity.

When knights and leaders of armies fought clad in armor and their faces covered with a visor, it was necessary that they should have some mark to distinguish them from the enemy as a modern uniform does, and also by which their own followers might identify them. This was the real objeet of heraldry, although symbols and signs were used by the Jews since history commences. Therefore, when a knight went to battle he carried some sign painted on his shield and a crest or top ornament on his helmet, so as to distinguish him from other leaders. For instance, the Plantagonets of England derive their name from wearing a piece of heath in their helmets, (the Norman French name for heath being Plantagenet,) and as the leaders of knights were always mounted their crest formed a conspicuous object.

After a while knights began to wear surtouts or tunics over their armor on which their arms were embroidered, and which served the purpose of keeping it from rust and also hiding the joints and insecure parts.

Armorial bearings are divided into eight classes, Dominion, Pretension, Concession, Community, Patronage, Alliance and Succession. These are assumed arms to which the bearer has no right. The shield is a field or ground upon which is painted the figures or mark constituting the coat of arms. These marks or distinctions were worn on bucklers or shields before they were placed on banners, flags or coat armor, and are still, when used, generally placed on a shield. The shield is divided into nine points, each of which has a seprate name, the upper left hand corner is called the dexter-chief; the upper right hand corner, the sinister-chief; the center between, the middle-chief; the lower end of the shield is known as the dexter, middle and sinister bases in the same manner; the centre is called the fesse point, and the portions at the top and bottom of it are known respectively, as the honor and nombril points.

The colors used in painting arms are called tinctures, two of which are metal and seven colors; they are known as follows: Gold or silver, argent; blue, azure; red, gules; green, vert; purple, purpure; black, sable; orange, zeny; bloodcolor, sanguine; the last two colors are not used by the French in cut stonework or engravings, or is shown by dots; argent is plain, azure by horizontal lines, gules by perpendicular lines, vert by diagonal lines from dexter-chiet to sinister base, purpure by lines running from sinister-chief to dexter base, sable by perpendicular and horizontal lines crosing each other, zenny same as purpure with horizontal lines crossing them, and sanguine by diagonal lines crossing each other at right angles.

The coats of noblemen are described by precious stones—topaz, pearl, diamond, ruby, sapphire, emerald, amythist, jacinth and sardonyx; those of kings and princes by the planets, as Sol, Luna, Saturn, Mars, Jupiter, Venus, Mercury, Dragon's head and Dragon's tail, these colors are arranged in the same order as given before. When furs are used in heraldry, as they were sometimes as a cover to the shield, they are known as ermine, which is a field of argent or silver powdered with black spots, with three tails to each. Ermines the same, only the colors are reversed erminois when the field is gold, and the spots black and vair, which is blue and white checkers only, cut in the form of little bells, so that the top of one forms the bottom of another

When an escutcheon is one color only it is said to be of one tincture, but when more than one it may be divided by lines of different forms, such as wavy, embattled, nebuly, vaguely, dovetailed, etc., which could not be explained without a drawing. When these lines divide the shield in equal parts, if upward, it is called parted per pale; when across, parted per fesse; when by the diagonal dexter, parted per bend; by the diagonal sinister, parted per bend sinister. When divided by two lines, one horizontal and one perpendicular, it is called quartered, and when the cross is diagonal, it is called parted per saltier. When divided into a lot of squares, so as to show the alliances of a family, it is called an achievement. [Besides borders or patterns around a coat of arms, there are six different works to denote the descent from an original person. First son, the label; second son, crescent; third, mullet; fourth, martlet; fifth, the amulet; sixth, the fleur de lis; these are all that are generally used, but heralders have combinations which will tell the distinct descent as far as 64].

The general ordinary divisions of a shield consists of the cross, saltier, chief, pale, bend, fess, bar and chevron. In describing a coat of arms which was white, with a black cross on it and four red stars are in each angle, the heraldic description would be argent (white), a cross (sable) between four estoiles gules (red). The older the coat of arms the plainer it is, generally speaking, as it was only when

heraldry came prominently into use that it was necessary to complicate the devices.

Beasts are more honorable than birds, birds than fishes, and fishes than ordinary signs, etc, The ornaments that accompany coats of arms are the crown, coronet, mitre, helmets, mantlings, chapeaus, wreaths, crests, scrolls and supporters. The helmet was an iron case for the head, with a sliding or hinged piece to cover the face, leaving holes to see through. It is now used as a chief ornament over a coat of arms to support the crest, which rests on a wreath which consisted of two skeins of silk twisted together, to be of the prominent colors in the arms; from this wreath the colors of a servant's livery is taken. The king's helmet is opened faced and grated, and has six bars. A duke and marquis has five bars; all peers have four bars. An open helmet denotes a baronet or knight, a close helmet a squire or gentleman; the king's helmet looks at you, the peer's is in profile, the baron's and knight's look at you, and the squire's and gentleman's is closed in profile.

A chapeau is an ancient hat worn by dukes, of scarlet velvet turned up with fur, it is sometimes used instead of a wreath under a crest. Supporters are figures, generally of beasts, standing at each side of a coat of arms, which were first used about A. D. 1500. They only belong to such grades of nobility as dukes, marquises, earls and barons, but have been granted to heads of clans and others for noble actions. The Fosters, for instance, have bears on their arms, on one side a forester, from which the name is derived, and on the other side a knight in armor, bearing on his shield their own arms with the name of Acre on it, as one of their ancestors saved the King of England's life at the battle of Acre. The Robertsons carry from the bottom of their shield a sword, as one of their ancestors saved James the Fourth of Scotland from being stabbed by an assassin. Both of these gentlemen have the right to wear their hats in the presence of royalty, or in an ordinary court of justice.

When arms are marshalled the husband's arms take the left hand side, the wife the right, but a bishop marshalls his arms with his see in the place of honor, and as if he were wearied of toil and no provision made for his wife. A maid carries her arms on a lozenge, a widow both her and her husband's on a lozenge, as women were not suposed to wear shields. When a man marries an heiress he carries her arms on a small shield or an escutcheon in the centre of his own, but the quartering of arms is too intricate a matter to go into in such a notice as this.

The beasts used in heraldry are the lion, tiger, bear, elk; the fish is also used without any definite distinction. The birds are the eagle, hawk and dove. The fabulous animals the griffin, cockatrice, harpey, dragon phœnix, wyern, pelican, etc., while the other signs amount to over six hundred different objects; these are also painted of any color.

The American flag is a modification of the arms of George Washington, and the English flag, known as the union jack, is a combination of the crosses of St. George, St. Patrick and St. Andrew. The Englsh order of knighthood are the Garter, instituted by Edward III. in 1349, it motto is familiar to all. *Honi soit qui mal y pense.* The Bath by Henry IV. in 1399, its motto ts *Tria juncto in uno.* The order of the thistle in 819 by King Achais of Scotland, its motto is *Nemo me impune lacessit*, and lastly, the order of St. Patrick by George III. in 1783, whose motto is *Quis separabit.*

The baronets mark of distinction is the red hand, which is carried in any portion of his arms which appear most suitable. Its heraldic description is argent, a sinister hand couped at the wrist and erected gules, it is borne in a canton or small square. Baronets were first made for the colonization of the province of Ulster in Ireland. Any person who gave the king £1,000, and provided one man armed and fully equipped for the service could obtain it, now it is generally conferred on professional men who have distinguished themselves. The origin of the red hand is that when Ireland was invaded by the Milesians, the commander of one boat said whoever should touch the land first would be the owner of that province, when O'Niale, of the bloody hand, cut off his hand with his sword and threw it on the shore.

There are many Americans who are entitled, by descent, to wear arms, but who have given up the use of them, but it is very easy to obtain a correct drawing by giving the date of emigration, full family name and county, their arms could be easily ascertained.

The shield has assumed different forms in every succeeding century, the first shape being round, then triangular with curved outwardly sides, after which it became of nearly any ornamental form admired by the draughtsman. To stained glass and architecture we are altogether indebted for our knowledge of heraldry, it being frequently reproduced.

Before closing this notice I will describe the royal arms of Great Britain and Ireland as it is, perhaps, the best known to our readers. First and fourth for England, gules—three lioncels passant, gardant proper; second for Scotland, or within a treasure, gules—a lion rampant of the last; fourth, azure—a harp or, stringed or, this last is now admitted to be a mistake, it should be green not blue.

It is very difficult in a notice like this to explain heraldry without using so many technicalities as would leave the subject completely bewildering to an ordinary reader. I have therefore confined myself as much as possible to generalities.

The United States Assay Office.

IT might be supposed that a class of business men dealing in gold in its various forms, as much as jewelers do, would have numerous transactions with the United States Assay Office—that disreputable-looking and inconvenient building in Wall street, near Nassau. We are assured by Mr. Thomas C. Acton, the Superintendent, however, that the dealings of jewelers with the Assay Office are few and far between. The assayers are principally employed in determining the value of ore as shipped to them from the gold mines of the country—mainly from the Rocky Mountain region. They are occasionally called upon to make special assays for jewelers, but these special calls do not number more than three or four a month. The United States Assay is recognized as entirely trustworthy, and millions of dollars worth of gold and silver are bought and sold annually at the valuation fixed upon it by these assayers. Gold is worth $20 an ounce, but it is presented at the Assay Office so mixed with other substances that the value of the original price varies from $2 to $20 an ounce.

Manufacturing jewelers sometimes take samples of new goods to be assayed in order to find out the precise amount of gold which enters into their composition. This is more as a check upon their workmen than for any other purpose. Manufacturers sometimes grow suspicious that the full quantity of pure gold which they send to their factories is not returned to them in manufactured goods. An assay of the goods very quickly determines this point. But the principal work done for jewelers at the Assay Office consists in determining the value of old broken up goods which have been thrown into the "hot-pot" and melted up with all their alloy and other impurities. This is given to the assayers in the form of a bar of what appears to be gold, and they ascertain the exact value of the mass. This value varies from $4 to $8 an ounce, seldom higher than the latter figure. There are some jewelers who make a business of buying old and broken jewelry, melting it up in the "hot-pot," and sending it to the Assay Office. Very frequently they are badly bitten in the operation, the quantity of pure gold evolved from the mass being scarcely sufficient to pay the cost of the assay—$2.50. It is strongly suspected that a goodly proportion of these "hot-pots" is made up of stolen goods, the class of jewelers who trade in broken jewelry very frequenty combining the more lucrative occupation of receivers of stolen goods with that of jeweler.

It often happens that manufacturing jewelers get on hand a stock of unsalable goods—silver and gold plate, fine jewelry, etc. The patterns has not pleased the fastidious public, and the goods are only worth the intrinsic value of the metal they contain. Such goods are sometimes sent to the Assay Office and are melted up. These frequently represent a greater value in the labor bestowed on them than in the metal they contain. The metal may be recovered, but the labor of the designer and the gold or silversmith are hopelessly lost. The exhibits of our manufacturers at the Centennial Exhibition were remarkable, not only for the richness of material used in their construction, but for the wealth of skill and workmanship bestowed upon them. When goods of this character are consigned to the crucible, as is not unfrequently the case, only the smallest item of their cost—the metal—is recovered. All the artistic skill expended upon their adornment is irredeemably lost. Values of this kind frequently disappear up the chimney of the Assay Office, mingled with the smoke arising from the crucibles that retain the gross metal, while the delicate fancies of the skilled artificers are lost forever. But there is little opportunity to indulge in sentiment in the Assay Office, where everything is of the most practical kind, the practice being to reduce all substances brought there to a dollar and cent basis. The elaborate solid silver plate of the artistic manufacturer mingles with the cheap jewelry brought in from East-Side "fences," and all is reduced to first principles—actual cash value.

Workshop Notes.

Bismuth Bronze.—A bronze which withstands oxydation and which is particularly suitable for the preparation of metal and lamp reflectors is made of the following: Copper, 52 parts; nickel, 30 parts; zinc, 12 parts; lead, 5 parts; bismuth, 1 part.

Hardening of Copper and its Alloys.—Everitt gives the following recipe: Melt together and stir until thoroughly incorporated copper, and from one to six per cent. of oxide of manganese. The other ingredients for bronze or other alloys may then be added. The copper then becomes homogeneous, harder and tougher.

An Easy Method of Silver Plating.—The *Revue Chronométrique* gives the following: Chloride of silver in paste, 8 parts; chloride of sodium, 1 part; carbonate of lime, 1 part; carbonate of potash, 3 parts. Mix well. Rub the copper article to be silvered with a little of this powder, taking care that it is perfectly clean first.

Green Varnish for Metal Articles.—A green varnish for metal articles may be thus prepared: Put as much arsenic or mastic into a strong potash lye as will be dissolved by it, then dilute the solution with water, and add a salt of copper (vitriol or ascetate of copper). The green precipitate should be washed, dried, and dissolved in oil of turpentine. Unfortunately, the mastic is too dear for the varnish to be used for all purposes.—*Industre Blaetter.*

The following method for taking slight scratches from watch glasses has been used with success: Dilute the ordinary hydrofluric acid, sold in gutta-percha bottles, with four or five parts of water; with this wet a cotton rubber, and apply the rubber to the glass pretty thoroughly; afterwards wash the glass till all traces of the acid are removed. The effect of this operation is to dissolve off a very thin portion of the glass, thus leaving a new and bright surface.

Preparation of Pure Zinc.—Common zinc is dissolved in hydrochloric acid; sulphuretted hydrogen is passed through the solution, which is then filtered. Iron is then oxidized with nitric acid and precipitated with ammonia, so that a part of the zinc remains with the precipitate. After allowing it to rest for 24 hours, filter, boil to dryness, and melt the chloride of zinc which is then reduced, mixed by chloride of sodium by sodium.—*Treresenius' Zeitschriften.*

Soldering Steel.—It is well known by those engaged in metallurgy that much difficulty exists in soldering steel; it may be interesting ts give the simple method, within the reach of all, employed by M. Fiala, of Prague. The material used is pulverized white marble. The two pieces to be soldered are heated, and after being rolled in the marble dust they are quickly placed one on the other and hammered. The same method may be used for small articles. —*Revue Chronométrique.*

Oxydising Silver.—Dr. Ellsner, in *Chem. Techn. Mittheilungen*, says that there are two distinct shades in use, one produced by chloride, which has a brownish tint, and the other by sulphur, which has a bluish black tint. To produce the former, it is only necessary to wash the article with a solution of sal-ammoniac; a much more beautiful tint, may, however, be obtained by employing a solution composed of equal parts of sulphate of copper and sal-ammoniac in vinegar. The fine black tint may be produced by a slightly warm solution of sulphuret of potassium or sodium.

Dead Color After Water Gilding.—A fine and delicate dead color is obtained with the following mixture: One ounce of saltpetre, half an ounce of alum, half an ounce of salt, and half an ounce of sulphate of zinc, all finely powdered, and made into a thin paste by adding some water; the gilded articles are covered with this paste, and put into an iron pan, and placed and left over the fire until the covering mixture has turned black; then suddenly plunge into cold water, and brush up with carbonate of soda; rinse well, and dry in warm sawdust of boxwood.

Cement for Joining Amber.—A solution of hard copal in pure ether, of the consistency of castor oil, is suggested by Ph. Rust for cementing amber. The carefully-cleaned surfaces of fracture, coated with the solution, should be pressed together, and retained in contact by means of a string wound around the object, or in some other suitable way. The operation should be performed as rapidly as possible, since the evaporation of the ether impairs the adhesion of the cement; so that all arrangements for compressing the object should be made before laying on the cement. A few days are required for the complete hardening of it. In repairing tubes, as for pipes, any of the solution happening to pass into the interior should be carefully removed at once with a slender feather.

Lacquer Work.—A good and economical lacquer is made by dissolving three parts of gum thuss and one part of clear shellac in methylated spirits. Then add some spirits of wine, and filter through fine muslin, and keep in a well stoppered bottle. To obtain a *deep color* lacquer use a larger quantity of shellac. After the articles to be lacquered are thoroughly cleaned, dipped, rinsed, and dried, they are put on a stove to be warmed, and the lacquer applied with a piece of sponge very thin and evenly all over the surface, and placed in a dust-free place to dry and set.—*H. Bush, in the British Jeweler and Metalworker.*

Straightening a Spiral.—Many watchmakers when they have a spiral to straighten or close up, simply place it flat on a piece of paper or an ivory surface, but the shadow thrown by the spires frequently renders the shape of the spiral indistinct, and does not permit of the distances between the spires being properly judged. A Parisian watchmaker, M. Majoury, overcomes this difficulty in a simple and efficacious manner. He places a watch glass on the bench, the higher the glass the better, ann puts the spiral he wishes to repair upon it. The light from beneath causes the troublesome shade to disappear, and every part of the spiral to be clearly seen. Several material dealers have already utilised this idea, and sell glass discs mounted on feet.—*Revue Chronométrique.*

To Fit Dials on Geneva Watches.—Amongst the various repairings it will often happen that new dials are required to replace damaged ones, and it is well known how seldom the feet of these new dials correspond with the old holes in the plate. The making of new holes is sometimes met with some obstacles, as they occasionally would come in contact with parts of the movement. In such cases it is best to cut the feet off, and carefully file flat with the enamel, then hold the dial in the proper place on the plate, and mark through the old holes the place for the feet to fill these holes; remove the enamel on these marked places with an emery file until a small place of the copper is laid bare. Then cut two feet out of an old dial, so as to leave a small plate on them, and solder these to the places for the purpose on the new dial. With a little care and practice the experiment will not fail to give the desired result, as regards strength of the feet and the neat fitting into the proper holes.—*Deutsche Uhrmacher Zeitung*

Tarnished Colored Gold and Dead Silver Articles may be restored by the following methods: (*a*) Colored gold: Dissolve one ounce of bicarbonate of soda, half an ounce of chloride of lime, and half an ounce of common salt in about four ounces of boiling water. Take a clean brush and wash the article in the hot solution *for a few seconds*, and rinse immediately in two clean waters; dry in warm sawdust, and finally rub over with tissue-paper. (*b*) Dead silver: Make a saturated solution of borax in water, or a strong solution of caustic soda, and bring the same to a boiling heat; place the article to be cleaned in a zinc vessel perforated at the side and bottom and dip the vessel into the boiling solution, when the surface of the article will like magic, assume the original whiteness. In the absence of a perforated zinc vessel, the articles may be placed direct into the solution, and on several places touched with a piece of zinc. The article is then rinsed in clean water and dried in warm sawdust.—*Ellgemeines Journal der Uhrmacherkunst.*

Mordants for Metals.—One of the best mordants for steel is recommended as follows: One part fuming nitric acid; 5 parts acetic acid. Mix gently. This mordant will act as powerfully in half a minute on steel as ordinary nitric acid in ten. For weak tints, and when more care and time are required, the preparation must be mixed with distilled water. An excellent copper mordant is, according to Dr. Boettger, the following: 10 parts fuming hydrochloric acid; 70 parts of water, to which a solution of 2 parts of chlorus acid is added in 20 parts of water. From 100 to 500 parts of water must be added for very fine work. An excellent mordant for copper, brass, and German silver is the following: Ten grammes of chlorous acid, dissolved by boiling in 100 grammes of water, to which after cooling is added 75 grammes of raw hydrochloric acid, and 200 grammes of water. For a deep mordant for zinc, copper, brass and steel there can be nothing better, according to J. J. Hess, than chromic acid, which must be diluted according to the purpose intended. By this process the nitric acid vapors are avoided, and the etching process is easily controlled. The etched places are shown well cut and perpendicular. Pure nitric acid with an adjunct of a little sulphate of copper, is specially adapted for copper and brass, or the following: Two parts of water; one part of fuming nitric acid. For silver, pure nitric acid.—*Der Metallarbelter.*

Trade Gossip.

Happy New year.

Mueller Bros., of Milwaukee made an assignment on the 28th ultimo.

Charleston has abolished her heavy license fee for commercial travelers.

Mr. Dickinson, jeweler, doing business at Ashtabula, Ohio, was recently burned out.

An attempt was recently made to rob the jewelry store of N. G. Wood & Son, Boston.

What it is to be the wife of a soap man. Mrs. Babbitt wears $280,000 worth of diamonds.

New chatelaine pockets are of velvet brocart on satin of delicate shades. The slender mountings are of silver.

A set of Sevres buttons were sold in Paris the other day for £114. Another proof of the terrible severity of the times.

Bouquet brooches are in all sorts of fantastic forms, such as those of lizards, serpents, bees, beetles, and other insects.

The 10th volume of this journal begins with the February number. Every enterprising watchmaker and jeweler reads it.

In Paris the rage is for old buttons, great prices being paid for those in steel, silver, jasper, pebbles, or Alencon diamonds.

Mr. D. I. Reynolds is about to sever his connection with A. M. Hays & Co. for the purpose of engaging in other business pursuits.

A clock is being exhibited at Paris which fires a shot every hour. Somebody says that its great practical utility is to "kill time."

Newest cuff buttons are either handsome antiques, blended enamwels ith quaint designs, or they are white enamel set in a border of red gold.

Nicoud & Howard have removed from 14 John Street to larger and more commodious quarters in Dedrick's building, No. 14 Maiden Lane.

Rauth & Sons' jewelry store, No. 168 Bowery, was entered by burglars on the evening of 7th inst., and robbed of nearly $9,000 worth of jewelry.

The dial, tablet and nickel shops of the Seth Thomas Clock Company, at Thomaston, Conn., were recently destroyed by fire. The loss is estimated at $50,000; insured.

When Edison has discovered the Elixir of Life and the Philosopher's Stone, there will be nothing left for him but to invent the great American $1.00 watch movement.

Pearls are the fashionable jewels this season. Dead gold is revived for the setting of them, or diamonds. Filagree ornaments in silver and gold have reappeared and also mosaic jewelry.

Mr. J. Quincey Walker, for many years with the American Clock Company, has assumed the Western agency of the Wm. C. Gilbert Clock Company. His headquarters will be at 170 State Street, Chicago.

The Eugenie vest chain, for ladies, is the latest novelty offered in this line of goods. It is intended to be worn in ladies' vests, and is secured in the buttonhole by a gold bar, that serves as a glove and shoe-buttoner.

M. S. Smith & Co., of Detroit, have done a very satisfactory holiday trade; the popularity of this house and the merited confidence reposed in them by the good people of that city have made their name famous in the West.

An original "Turner" has turned up in New Jersey. Turner's pictures possess one great advantage over all others, You can hang them in any direction—right side up, upside down, or sideways, the subject is equally magnificent and incomprehensible.

The fire which recently occurred in the upper part of the building occupied by Eugene Jaccard & Co., St. Louis, has injured their stock and fixtures to a considerable extent; the firm have been forced to seek temporary quarters in Fifth st., until the building is repaired.

James H. Brown, alias Warner, alias Patrick Cody and Edward Kelly, alias Pete Emerson, were sentenced by the Court of Common Pleas, at Providence, to imprisonment in the R. I. State Prison. Brown for a term of four years, and Kelly for three and a half years, for robbing the jewelry store of W. J. Tracy at Burrillville, R. I., in August last. None of the stolen property has been recovered.

Messrs. W. P. Sinnock & H. D. Sherrill, of the firm of Tingley, Sinnock & Sherrill, have bought out the interest of J. N. Tingley, the retiring partner; the new firm will continue the business under the firm name of Sinnock & Sherrill, at No. 5 Maiden Lane. We wish them a happy and prosperous career.

Pearls are very fashionable. It is rumored that they are this winter to replace diamonds. Large pearl earrings and necklaces are worn, and pearls are to adorn the hair. They are already much higher in price in Paris than they have been, and will probably become still more expensive.

Adams Express Company has done the largest holiday business this year of any season of ten years before, and perhaps the largest in twenty years. This, with the fact that all our "holiday stores" have had a more prosperous trade than usual, indicates very plainly that the times are improving.

Venus is now at her greatest distance from us—one hundred and sixty millions of miles—or one hundred and thirty-five millions farther away than when she is nearest the earth. This may seem startling but it is true. She always gets as far away from us as she can as soon as Congress meets. And we don't blame her.

The Elias Bros., well known as having been connected with the "sawdust game," Milton "gold" Jewelry, Royal Gold Watch, etc., and numerous lottery and gift enterprise schemes, have made an assignment for the benefit of their creditors. Their liabilities are estimated at $40,000. Their assets consist of odds and ends of all kinds.

Messrs. Reed & Barton have secured a lease of the large and magnificent building, No. 11 Union Square, and will fit it up in keeping with the artistic character of their productions. Messrs. B. & W. B. Smith, the well-known show case and cabinet makers, will have charge of the interior decorations of the store; we may, therefore, expect to see one of the handsomest warerooms to be found in this city.

Ornamental glassware in many styles, tinted with the glowing colors of the rainbow, has made its appearance in the shop windows. This iridescence glass is one of those brilliant little achievements of science that delights the eye and pleases the imagination. To produce the colors, the glass, while in a heated state, is subject to the vapor of chloride of tin. Shades of more or less depth or intensity are imparted by adding to the tin chloride a little nitrate of strontium or barium.

Messrs. Carter, Howkins & Sloan have recently introduced an attractive novelty in ladies' chains, designed to be worn suspended from the button-hole of the jacket, similar to that of a gentleman's vest chain. These goods are elegantly designed and mounted, and can be worn either at the button-hole of the *jacket*—the watch in one pocket and a charm or pencil in the other, or can be converted into a Leontine chain, the ornament serving as a bar to secure it at the throat. The chain can also be detached and worn as a neck lace. These goods will doubtless become popular with the ladies.

The second annual meeting of the Jewelers' League will be held at the rooms of the Board of Insurance Brokers, on the 21st inst. We are happy to state that this admirable institution is rapidly increasing in strength and importance, new members being admitted at every meeting of the Board. We would call the especial attention of members to the importance of promptly remitting the assessment which was rendered necessary to cover the first death loss, of which notification has been forwarded to every member. This is a duty that ought to be attended to at once.

The annual dinner of the Chicago Jewelers Association was held at the Grand Pacific Hotel, Chicago, on the 9th of January at six o'clock, where a large number of leading representatives of the trade assembled together for pleasure and profit. We regret that we were unable to accept the invitation forwarded to us by Secretary J. H. Weber, and in consequence of the irregularity of the mails at present, no detailed account of the session has reached us in time for publication in the current number. We are, however, quite sure that the occasion was very enjoyable, and that the Chicago Jewelers Association is fulfilling the highest hopes of its founders.

Mr. C. L Otto, jeweler, of Peoria, Ill., reported recently to the good people of that city, that he had been robbed of $2,800 in cash and $10,000 in goods. His statement was regarded as somewhat gauzy in texture, and a search was made for the missing money and goods. The former was found secreted in the clock tower of the town hall, and the goods in a lumber pile. Otto was arrested and his brother was held as an accomplice. Creditors have attached the goods and hope to recover a portion of the amount due them. Mr. Otto is evidently one of those graceless scamps who *Otto* be made an example of—and his brother *Otto* also.

Foreign Notes.

The manufacture of jewelry from the pure blood of the ox is flourishing in Germany. The blood is dried, reduced to a powder, and then molded and polished. The ornaments thus produced are capable of very high polish.

The success of the Grand Exposition lottery in Paris has induced the French Government to organize a scheme for raffling off the crown jewels of that country. The tickets are to range from $2 to $5 in price, and something like a hundred million chances will be put upon the market.

A speaker upon the subject of nude art before the British Association recently said: "In French art there have been questionable nude figures exhibited; but the fault was not that they were nude, but that they were the portraits of ugly, immodest women.

Tiffany & Co.'s reproduction of the Cesnola collections are said to be executed with marvelous fidelity. The collection exhibited at Paris has been disposed of to Parisian dealers. A crop of these reproductions have already made their appearance in Paris and England.

A gas clock has been placed on exhibition in England. The motive power is hydrogen gas produced by the action of sulphuric acid and water in a zinc globe. As the gas is generated it raises a glass bell-cover, which as it rises moves a lever that controls the hands of the clock.

A perpetual clock, says *La Nature*, is proposed by a French inventor, based on the difference of atmospheric temperature by day and by night. The heat of day causes a liquid to rise into a reservoir, whence it falls by gravity, so operating the mechanism. This is a very old idea. More than twenty years ago we saw the form of a perpetual clock, which was wound by the diurnal rise and fall of a column of oil.

The African Diamond diggings at the Dutoitspan fields have been uncommonly successful of late, and, besides several beautiful stones, of fifty carats each, a large diamond weighing 244 carats was recently picked up on a claim belonging to a Captain Jones. The "water" of the stone is not of the first quality, being of a light "off-color," but the gem is free from flaw. This is the second largest diamond ever found in South Africa, the "Spalding" diamond, found in the river diggings some years ago, and weighing 288½ carats, being the largest.

A peal of twenty-eight silver bells has arrived at Eaton Hall, the seat of the Duke of Westminster, for the tower of the chapel attached to the Hall. The largest bell, which weighs more than two tons, and is in the key of F—the complete set making two complete octaves and three notes above—bears the following inscription: "This peal of twenty-eight bells was cast at Louvain for the Duke of Westminster, by S. Van Aerschodt, A. D., 1877." The referee appointed to certify to the tone of the bells was Dr. Stainer. It is said that the cost of the peal is $30,000.

An ingenious substitute for illuminated tower clocks is due to Reiniger, of Stuttgart, the device being, as described, no more or less than the use of a magic lantern, sometimes employed for street advertising in this country. A lantern is so arranged that the picture of a watch or chronometer strikes upon a suitable white screen. The movements of the hands are as distinct as those of a real clock with a transparent face and strong light behind it; while it has the advantage over many of these, that the axis to which the hands are arranged does not throw a shadow, often mistaken for one of the hands themselves. The plan at least saves the expense of a costly tower clock with illuminated face.

Do pearls breed? This question is exciting no small interest to the scientific mind at the present moment. Mr. F. Buckland, of London, had some specimens of breeding pearls sent to him from Borneo, and confesses himself fairly puzzled. Any one ablé to throw light upon the subject is requested to communicate with him at 37 Albany street, Regent's Park. The pearls resemble the common seed pearls, and are kept in a glass globe, with some grains of rice to feed upon. Three or four months have now elapsed since they were despatched on their journey, and the rice has all the appearance of having been partially eaten. A curious speck in the grain of rice almost suggests that the germ —whatever it may be—is deposited in the rice. I heard of breeding pearls twenty-five years ago from a lady who had some, but I never actually saw any before.

Nickel Jewelry.—The French seem to be quick in recognizing the merits of a substance for decorative purposes. They are now making jewelry from nickel ore. They are from the famous new Caledonian nickel mines that has recently been put on the market under the name of nouméite, in the shape of brooches, ear-rings, etc. It is grayish green, and has been extensively used by Christofle & Co.

A parure of diamonds exhibited by Messrs. Boucheron, of Paris, and consisting of a diadem, brooch and pendants, bracelet ring and earrings, has been purchased by Mrs. Mackay, wife of the fortunate Bonanza proprietor, for £34,000. The parure is profusely ornamented with blue sapphires, and terminates with a handsome pearl; the center sapphire is valued at £4,000. The same lady has also bought another exhibit of this firm, a necklace of brilliants, terminating in a briolet drop, valued at £5,000.

M. Recordon, of Paris, has patented a process for illuminated watch dials on an entirely different principle from those produced by the use of chemicals. His device is described as follows: A Geissler tube containing a gas which gives a brilliant light is placed on the dial; a battery about the size of a thimble is attached as an ornament to the watch chain, and a miniature induction coil is also hidden in the latter. When it becomes desirable to consult the watch in the dark, a spring is pressed, the current passes into the coil, then into the Geissler tube, and illuminates the dial. The portable battery used for this purpose is that of Trouvé, which, in a small compass has considerable strength. Reduced to the size of a thimble it is still sufficiently strong in its action to last a year. M. Recordon also applies the same principle to the illumination of clock faces.

Dr. Schliemann has again had the good fortune to unearth from the depths underneath the site of the Homerick Illum, at Hissarlick, more "treasure-trove." No less than four buried hoards of prehistoric treasures have been iliscovered—one consisting of gold earrings bracelets and beads, and one—by far the most precious of all —consisting of a bronze vessel filled with gold earrings, bracelets and beads, with a spiral pattern on them, a large round piece, and sixteen bars of solid gold, several silver ornaments, and some bronze axes. All the relics of antiquity will enrich the Imperial museum, as, by his compact with the government, although Dr. Schliemann is to bear the entire cost of the excavation at Hissarik, all antiquities found are the property of the museum. According, however to an another athority, the treasure-trove will be equally divided between Dr. Schleimann and the Turkish Government.

Some time ago it was reported that watches were being made in Switzerland with phosphorescent dials, so that the hour could be ascertained from them at any time of night without the aid of artificial light. M. Olivier Mathey, a Neufchatel, chemist, communicates the following information in regard to the composition of these dials to one of our French exchanges: Phosphorescent dials are usually made of paper or thin cardboard, enameled like visiting cards; they are covered with an adhesive varnish, or with white wax mixed with a little turpentine, upon which is dusted, with a fine sieve, powdered sulphide of barium—a salt which retains its phosphorescence for some little time. The sulphides of strontium and calcium possess the same property, but lose it more quickly than the former. After the dial has remained in darkness some days it loses its phosphorescence; but this may be readily restored by exposure of an hour to sunlight, or, better still, by burning near the dial a few inches of magnesium wire, which gives forth numerous chemical rays.

In a communication to the Paris Académie des Sciences, read on the 14th day of October, M. Delafontaine announced the discovery of the oxide of another new metal, to which he has given the name of Phillippium (Pp), in honor of M. Philippe Plantamour, of Geneva, a friend and pupil of Berzelius. M. Delafontaine describes the new element as forming a fourth member of the yttria group of earths. It is yellow, and assuming provisionally that the phillippia obtained is in the state of protaxide, its equivalent would be 90 and 95. Its concentrated solution examined with the spectroscope showed a rather broad and very intense magnificent characteristic absorbtion band in the indi8o. On the 38th of the same month the same gentleman made known to the Acadmy another new metal, which he calls decipium, found like yttrium and its cogeners in the samarskite and gadolinite from the United States. At present very little is known about decipium, but its oxide is white, while, as before remarked, that of phillippium is yellow. In giving the chemical equivalents of some of these new metals of the same group, such as yttrium, terpium, phillipium, and decipium, M. Dumas remarked that chemists find themselves in the presence of new bodies whose series offer some gaps, but if researches are continued we shall soon have more precise and complete data.

INDEX TO VOLUME IX.

A

An Ingenious Clock..... 12
A New Metal 17
Astronomical Terms Relating to Time.... 35
Antiquities from Central America..... 37
A Change of Base..... 44
Artificial Rubies..... 73
A Much Needed Reform..... 98
A Deserved Tribute..... 383
Ancient and Modern Jewelry. 104
Art in Metal..... 109
American Plated Ware in Europe..... 114
A Hint to Uncle Sam..... 115
A New Compensation Balance..... 116
A Remarkable Clock... 139
An Instructive Essay.....155
Artificial Diamonds..... 159
An Important Decision..... 179
American Electro-Plate in England..... 208
Artificial Production of Precious Stones.... 212
Ancient Irish Jewelry..... 226

B

Blue and White China..... 130
Ben Lander..... 148
Beaumarchais..... 166
Business Notes..... 176, 202

C

Character, Capacity, and Capital.. 42
Cost of Diamond Digging..... 148
Commercial Travelers and Drummers..... 178
Cleaning and Repairing French Clocks'.... 197
Corundum..... 197
Close of the Ninth Volume..... 223

D

Dissolving Soft Solder.... 9
Drilling Square Holes..... 193
Debased Gold Watch Cases..... 204
Dissolution of American Clock Co..... 225

E

Engraving and Chasing..... 18
Engraving..... 29, 45
Extension Rings..... 93
Electro Gilding and Soldering.....100, 127
Express Companies..... 154
Encouraging Youthful Efforts..... 155

F

Foreign Notes, 19, 38, 44, 95, 99, 130, 174, 200 239
Fraudulent Bankrupts..... 97
Fusible Cement..... 103
Fire Gilding..... 148
Fourth Annual Banquet (Jewelers' Association)..... 205
Failures of 1878..... 224
Fitting Balance Staffs 230

G

Going to Europe..... 79
Gold Lace..... 88
Guedin, Jacques (obituary)..... 195
Gold at Par..... 223
Gilding Watch Movements..... 225

H

How They Go Into Bankruptcy..... 2
Horological Revivals..... 6
How Pins are Made..... 28
Historical Notes..... 151
Horology..... 193, 215

I

Illegitimate Competition..... 42
Influence of Air Pressure on Clocks..... 66
Irish Belleckware..... 71
Indian Jewelry..... 129
Inventions and Improvements..... 131, 150
Inland Customs..... 155
Insurance Protection..... 178

J

Jottings..... 22, 43, 99, 116, 117, 135, 145, 150
Jobbers and Retailers..... 204

L

Legal Regulations for the Standard of Gold and Silverware..... 117, 142, 171, 199, 217

M

Manufacture of Jewelry..... 5
More Copper than Conscience..... 81
Metals and Alloys 144
Misdirected Genius..... 203

N

Novelties in Jewelry..... 112, 222
New Alloys..... 230

O

Our Commercial Conscience... 63
Our Paris Letter..... 83
Old Blue Nankin..... 107
Our Success at Paris..... 177
Overstocking Retailers..... 177
Our First Death Loss Paid..... 225

P

Prospects of Business..... 1
Practical Hints on Watch Repairing, 7, 26, 49, 76, 86, 105, 119, 140, 161, 181, 213, 227
Proceedings of the Horological Club, 10, 23, 46, 69, 91, 101, 125, 136, 156, 190, 209, 233
Precious Stones and Gems, 13, 31, 53, 74 89, 122, 146, 167, 185, 219, 231
Protest of the Jewelers' Association..... 38
Pivot Drills..... 129

R

Revival in Antique Jewelry..... 16, 37
Repairing Musical Boxes..... 51, 72, 84
Refreshing Impudence..... 98
Retail Jobbers..... 133
Returning from Europe..... 149

S

Silver..... 37
Sea Beans..... 43
Soft Solder 56
Silver in Art 78
Sherman of Chicago..... 115
Sham Cape Diamonds..... 121
Smith, M. S. & Co..... 150
Send in Your Orders..... 153
Savage, Lyman & Co..... 179
Soldering 184
Swiss Industries..... 197
Stolen Goods 208
South American Trade..... 224
Silver Dollars..... 226

T

To Our Subscribers.. 1
The Uncertainties of Law..... 2
The Swiss Consul's Report..... 2
The Jewelers' League..... 3, 82, 173
The Exhibit of Goldsmith's Work at the Loan Exhibition..... 4
The Behavior of Steel During Hardening.. 6
Trade Gossip, 20, 40, 60, 80, 96, 112, 132, 152, 173, 198, 222, 238
The Paris Exposition..... 21, 169
The Retail Trade..... 21
The Magnetic Properties of Nickel..... 28
The Manufacture of Jewelry..... 30, 52, 67
The Tempering of Steel..... 36
The Ansonia Clock Co..... 38, 150
The East and West..... 41
To the Trade..... 41, 61
The North and the South..... 61
The Repeal of the Bankrupt Law..... 62
Traveling Auctioneers..... 62
The Balance of Trade..... 63
The Influence of Oriental Art..... 65
The Tourmaline..... 85
To Clean Tarnished Brass..... 88
The Colors of Precious Stones..... 108
The Jobbers' Convention..... 113
The Goldsmiths' Work at Mycenæ 118
The Stop-Work in Watches..... 124, 139
Trade Dollars..... 133
The Bankrupt Law..... 134
The Afflicted South... 135
Theory of Vision..... 145
The State of Trade..... 153
The Collapsed Convention 154
The Plague-Stricken South..... 155
The Pneumatic Clock..... 159
The Flat and Curved Hair Springs..... 160
The Original Master Humphrey's Clock.... 163
The French Watch and Clock Trade in 1867 and 1878..... 164
The Gold and Silversmiths's Work at the Paris Exposition.. ..... 170, 180
The First Death Loss of the League..... 179
True Time Regulator..... 196
The Howard Regulator..... 196
The Political Situation..... 203
Tula Silver 212
The American Pedometer..... 216
Table Forks..... 221
The Nickel Platers..... 221
The Line Drawn..... 224
The Science of Heraldry..... 235

U

United States Mint Items..... 36

V

Volume IX..... 1
Various Proceses of Coloring and Finishing..... 15, 33, 55
Very Slow..... 63
Views of a Correspondent..... 148

W

Workshop Receipts, 39, 59, 94, 131, 149, 175, 201, 237
Will Business Revive..... 97
Watch and Chronometer Jeweling..... 188



17



28







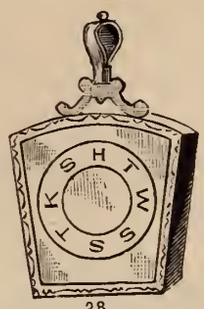
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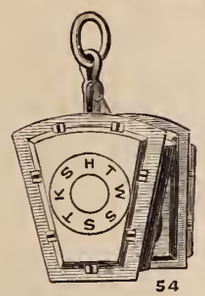
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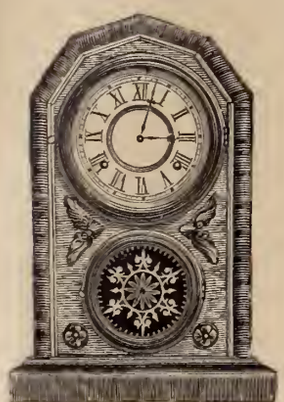
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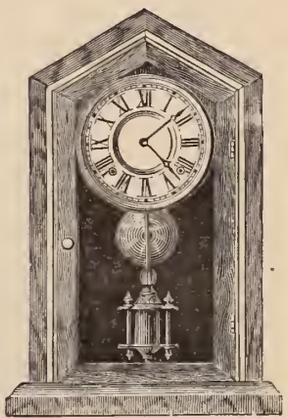
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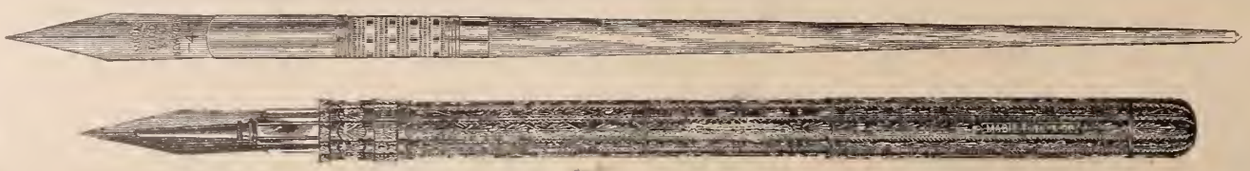

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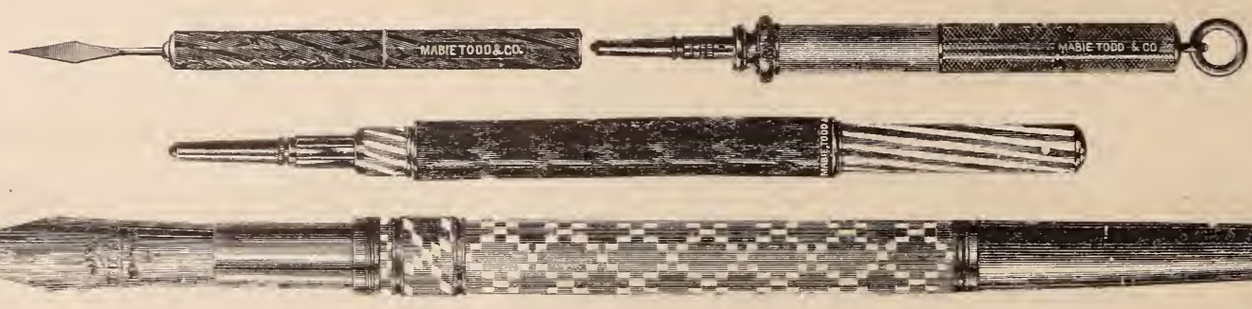
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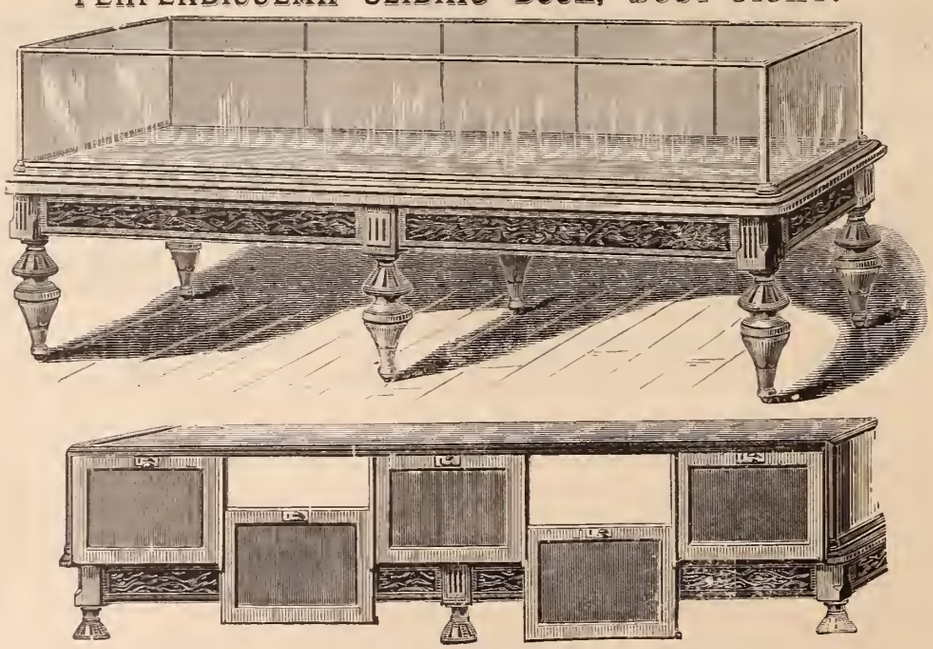


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Manufacturers of STERLING SILVER WARE, in all branches and in great variety, of the highest character of workmanship and artistic design.

With our unequalled facilities for the production of goods in large quantities, we are enabled to offer the trade a rapid succession of novelties in fancy silver ware, and at prices that will commend them to the most prudent purchasers. We are now introducing new and novel effects in decoration that are peculiarly our own, and have not been attempted elsewhere.

We would invite special attention to our new illustrated lists of forks and spoons, comprising all of our regular patterns that have become staple with the trade, such as **Cottage, Swiss, Raphael, Lady Washington. Knickerbocker,** etc., etc. To this line we have now added the **New King's,** intended to meet the tastes and requirements of the best class of trade, being massive, bold in design, and ornamented in high relief, somewhat resembling the **Old King's** of English manufacture, that has been accepted as the standard patterns by the English trade for so many years. But modernized and improved, we offer this pattern to the trade as being of a higher character than anything that has of late been placed upon the market.

Our line of **Gorham Plated Ware** is presented by us as the best possible substitute for solid silver, being made of hard metal, silver soldered at every joint and **very Heavily Plated.**

This ware has now been on the market for 12 years, and during that time has maintained its reputation of being a better class of plated ware than has ever before been manufactured in this country if not in the **World**

We are now offering these goods at considerably less than former prices, while the quality will be fully up to its former standard of excellence.

GORHAM MANUFACTURING CO.,
37 Union Square.

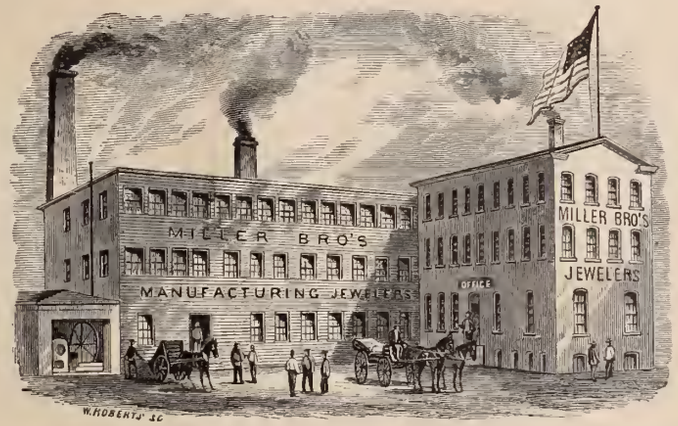
MILLER BRO'S,

MANUFACTURING JEWELERS,

No. 11 MAIDEN LANE, NEW YORK.

Manuf ctory, 47, 49 & 51 Franklin Street, Newark, N. J.

INITIAL GOODS A SPECIALTY!



Seals, Lockets, Sets, Sleeve Buttons, Studs, Collar and Chemise Buttons.

ATTENTION IS INVITED TO OUR

NEW STYLES OF ETRUSCAN SLEEVE BUTTONS,

MOUNTED WITH

RUSTIC LETTERS,

BIRDS, ANIMAL HEADS AND FANCY ORNAMENTATIONS.

Sussfeld, Lorsch & Co.,

IMPORTERS OF

Optical and Mathematical Instruments,

Watchmakers' Tools, Materials, Watch Glasses, &c.

No. 13 Maiden Lane, New York.

Sole Depot in the United States for
BARDOU & SON'S
Universal Opera Glasses,
U. S. ARMY & NAVY SIGNAL GLASSES,
&c., &c.

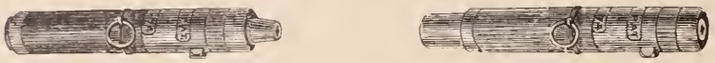
G B
TRADE MARK

Sole Depot in the United States for the
CELEBRATED
Crown Spectacles and Eye Glasses,
OF ALL GRADES.

TRADE MARK

Commission Merchants at 27 Rue de Paradis, Poissonniere, Paris.

NORCROSS PATENT DUST-PROOF KEY.



KEY OPEN. Patented July 14th, 1874. KEY CLOSED.

This Key is preferred to all others, as there is no possibility of dust accumulating in the pipe. It will not break or wear like other Keys, being made of Stub's steel, hardened and tempered.

CLEMENS OSKAMP,

Manufacturing Jeweler,

And SILVERSMITH,

IMPORTER & WHOLESALE DEALER IN WATCHES,

CLOCKS, MATERIALS & OPTICAL GOODS.

No. 175 Vine Street,

CINCINNATI.

ESTABLISHED 1837.

VICTOR BISHOP & CO.,

IMPORTERS OF

Diamonds, Precious Stones, Mosaics, Cameos

CORAL JEWELRY,

Imitation Stones, Roman Pearls

FINE FRENCH BEADS,

Of all Colors, in Strings and Necklaces.

Diamond Scales, Gold Shells, Silver and Copper Foil, &c.

ENAMEL OF ALL COLORS AND QUALITY.

No. 47 NASSAU STREET, NEW YORK.

House in Paris, 66 Boulevard de Sebastopol.

AMASA BRAINERD, JOHN W. STEELE, DYER BRAINERD

BRAINERD, STEELE & CO.,

MANUFACTURERS OF

Brainerd's Pat. Lockets,



(Patented June 17, 1874.)

These Lockets combine both beauty and strength. They are made of solid 14kt. gold, and the stones used are the finest obtainable in the market. The cost of them are no more if as much as Lockets of the old style, and the combination of secrecy and durability renders them much more desirable. We make three sizes in four different shapes—round, oval cushion, and oblong square. Also Sleeve Buttons of the same style, containing a concealed box for miniatures—being a novelty new to the Trade.



FINE GOLD JEWELRY,

No. 9 Maiden Lane,

NEW YORK.

JEWELERS' FINDINGS.

DENNISON & CO.,

MANUFACTURERS OF

Paper Boxes, Jewelry Cards, Tags,

PINK AND WHITE COTTON,

TISSUE PAPERS, JEWELERS' AND PLATE BRUSHES, SEALING WAX, RUBBER BANDS, &c. SEND FOR CATALOGUE.

Sole Propietors of Millers' Specialties!

JEWELRY CASKETS, SILVER WHITE CASKETS, and

SILVER WHITE, the best article for Cleaning Silver and Plated Ware. Samples furnished the Trade for distribution.

DENNISON & CO,

Boston, New York, Philadelphia, Chicago, Cincinnati, St. Louis.

TO THE FALL TRADE.

Dorrance Edge & Co.

MANUFACTURERS OF

THE CELEBRATED WOVEN FABRIC

GOLD CHAIN.

Elegantly Mounted Bracelets, Opera, Leontine,

VICTORIA WATCH GUARDS & NECKLACES, in all the Newest Designs.

☞Our stock is unusually complete, and, in addition to the above, a variety of **Necklaces**, from 1½ to 40 dwt. each, to which we invite the attention of buyers.

No. 9 John Street, New York.

Factory, 46 Greene Street, Newark, N. J.

Established 1837.

TAYLOR & BROTHER,

(Late Taylor, Olmsted & Taylor),

Diamonds, Pearls and Precious Stones,

Manufacturers of Diamond Mountings,

FOREIGN WATCHES, CLOCKS & BRONZES, FANCY GOODS.

SOLE AGENTS FOR JACQUES LE COULTRE RAZORS.

No. 676 Broadway, New York.

Established 1847.

J. T. SCOTT & CO.

Importers of Watches,

MANUFACTURERS OF JEWELRY,

—AND—

Jobbers in all grades of American Movements,

GOLD AND SILVER CASES.

Gold Chains, Jewelry, Diamonds, Clocks, Silverware, &c.

No. 11 Maiden Lane, New York.

☞Prompt and careful attention given to filling orders for all kinds of goods pertaining to the trade. Goods sent on approval when satisfactory references are furnished.

☞ Designs and estimates given, and special attention paid to orders from jewelers for Watches, Badges, etc., desired for presentations

☞Price List of American Watches, &c., sent only to regularly established dealers.

SAXTON, SMITH & CO.

MANUFACTURERS OF

Fine Gold Chain.

No. 194 BROADWAY

New York.

Factory, No. 183 Eddy Street, Providence, R. I.

Sole Agents for the new Patented Chain Bar, containing a detachable Pencil.

WOOD & HUGHES,

STERLING

Silverware Manufacturers

No. 16 JOHN STREET,

NEW YORK.

BUCKENHAM, COLE & HALL,

IMPORTERS OF

Diamonds, Pearls

AND OTHER PRECIOUS STONES,

MANUFACTURERS OF FINE JEWELRY,

10 Maiden Lane, New York

☞ A large stock of FINE DIAMONDS, Mounted and Unmounted kept constantly on hand. Goods sent on approval to any part of the country on receipt of satisfactory references.

Established 1850.

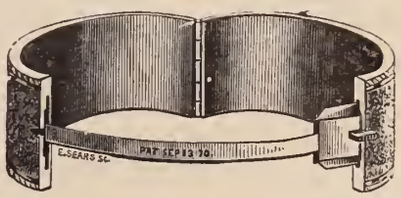
WM. H. BALL,

(Successor to BALL & BARNARD),

Manufacturing Jeweler

Fine Gold, Enameled and Colored Bracelets, with Patent Guards,

A SPECIALTY!



No. 9 JOHN STREET, NEW YORK.

Factory, 30 Franklin Street, Newark, N. J.

TRADE  MARK.

WHITING M'F'G COMPANY,
STERLING
SILVERSMITHS,
WORKS & WAREROOMS,
Broadway & Fourth St., New York.
WHOLESALE ONLY.

SMITH, HEDGES & CO.
IMPORTERS OF
DIAMONDS
Which are offered to the Trade, mounted or unmounted.
No. 1 Maiden Lane, cor. Broadway,
NEW YORK.

CARTER, HOWKINS & SLOAN,
MANUFACTURING
JEWELERS,
WHITING BUILDING,
Corner of Broadway and Fourth Street,
A. CARTER JR.
WM. HOWKINS,
A. K. SLOAN.
NEW YORK.
C. E. HASTINGS,
GEO. R. HOWE,
W. T. CARTER.

Established 1817.
Ve. J. MAGNIN, GUÉDIN & CO.
Manufacturers and Importers,
FINE SWISS WATCHES,
REPEATERS, CHRONOGRAPHS & CALENDARS.
GENEVA GOLD JEWELRY,
FRENCH CLOCKS AND BRONZES,
RICH FANCY GOODS,
HORSE-TIMERS & PODOMETERS,
GOLD AND SILVER CHATELAINE WATCHES.
No. 652 BROADWAY, NEW YORK.
Sole Agents for the James Nardin Watch.
House in Geneva, 14 Grand Quai.

HALE & MULFORD,
MANUFACTURERS OF
RICH JEWELRY,
(WHITING BUILDING),
No. 694 Broadway, corner 4th Street,
NEW YORK.
Stone and Stone Cameo Goods, Rings, Necklaces, Colored and Etruscan Work, Etc.
FIRST CLASS GOODS OF OUR OWN MAKE
EXCLUSIVELY!

BALDWIN, SEXTON & PETERSON
MANUFACTURERS OF
Fine Jewelry,
Diamond and Stone Cameo Goods,
GOLD CHAINS, &c.
Importers of Diamonds, Pearls, Emeralds, Rubies, &c.
WHITING BUILDING,
Cor. Broadway and Fourth Street,
NEW YORK.



THE

Adams & Shaw Company,

SILVERSMITHS,

694 BROADWAY, - - - - NEW YORK.

THE ADAMS & SHAW COMPANY have prepared expressly for the current wedding season a fresh and brilliant line of Sterling Silver Ware.

THE ADAMS & SHAW COMPANY manufacture for the trade exclusively and decline to sell at retail.

THE ADAMS & SHAW COMPANY will stamp the name of their customers upon goods and cases, whenever practicable to do so.

THE ADAMS & SHAW COMPANY ask especial attention to their Spoon and Fork patterns, which are conceded to be the most successful in the market.

THE ADAMS & SHAW COMPANY are prepared to furnish designs and estimates for Testimonials, both public and private, military and long-range rifle matches, Race Cups, etc., etc., upon application. They have for this purpose a rich variety of decorative patterns and designs, accumulated through twenty years manufacturing of fashionable testimonials, affording special advantages to customers in point of beauty and economy.

THE ADAMS & SHAW COMPANY also make the very finest Hard Metal, Silver-Soldered Plated Ware in special designs. They were the first to discard entirely the use of soft solder in soldering the joints, mounts, etc., and no such weak spot or defect can be found in any piece of ware ever made by them. They received the highest award, Medal and Diploma, at the Centennial Exhibition for Hard Metal, Silver-Soldered Electro Plate.

Greason, Bogart & Pierce,

Successors to Arthur, Rumrill & Co.

MANUFACTURERS OF GOLD CHAINS,

AND

FINE ETRUSCAN JEWELRY,

Nos. 182 and 184 BROADWAY,

New York.

ENOS RICHARDSON & CO.

MANUFACTURERS OF

FINE GOLD JEWELRY,

Gold Chains, Lockets, Crosses and Necklaces,

COLORED AND ETRUSCAN WORK.

All Goods sold strictly of our own manufacture.

23 MAIDEN LANE, NEW YORK.

ENOS RICHARDSON, L. P. BROWN, F. H. RICHARDSON,
THOS. SLATER, W. P. MELCHER.

ONYX GOODS A SPECIALTY!

JOHN A. RILEY & CO.,

Manufacturing Jewelers,

ETRUSCAN GOLD AND CORAL SETS, ROMAN BRACELETS, NECKLACES, &C.

Nos. 7 and 9 BOND STREET

NEW YORK.

No. 126 Kearny Street, San Francisco, Cal.

Established 1813.

THOMAS G. BROWN,

MANUFACTURER OF

FINE JEWELRY,

NEWARK, N. J.

—AND—

9 BOND STREET, NEW YORK.

DENNIS M. FITCH, (Of late firms, Fitch & Chatterton, Merrill, Fitch & Allin.) SAM'L L. HOWLAND. CHAS. S. FITCH.

D. M. FITCH & CO.,

MANUFACTURERS OF

FINE JEWELRY,

No. 15 JOHN STREET,

NEW YORK.

DESIGNS FURNISHED AND ESTIMATES GIVEN.

Special attention paid to orders for Badges, Medals, &c.

Diamond and Pearl Mountings a Specialty.

POST & SPEIR,

MANUFACTURERS OF

FINE JEWELRY.

SPECIALTIES:

Band Bracelets,

Stone Cameo Goods,

And Seal Rings.

No. 192 BROADWAY,

NEW YORK.

CARROW, CROTHERS & CO.

MANUFACTURERS OF

FINE JEWELRY,

No. 12 John Street, New York.

Specialties!

FINE LINKED SLEEVE BUTTONS, ROMAN BAND BRACELETS, LOCKETS & CROSSES.

N. B.—We desire to call the attention of the Trade to our IMPROVED BRACELET CATCH, and our new styles of Link Sleeve Buttons.

Established 1846.

WILLIAM RIKER,

No. 5 Maiden Lane, New York.

Factory, 42 Court Street, Newark N. J.

Would invite the attention of the Trade to our new Style of Inlaid Gold Jewelry.

CHATELLIER & SPENCE,

Manufacturing Jewelers,

652 BROADWAY, NEW YORK.

No. 1129 Chestnut Street, PHILADELPHIA, PA.

No. 12 West Street, BOSTON, MASS.

No. 120 Sutter Street, SAN FRANCISCO, CAL.

Chatterton & Dodd,

(Successors to Fitch & Chatterton).



Manufacturers of Fine Gold Jewelry

No. 19 JOHN STREET,

GEORGE W. CHATTERTON.
DAVID DODD.

NEW YORK.

NOAH MITCHELL,

MANUFACTURER OF

Fine Gold Jewelry

CAMEO SETS, ONYX GOODS,

Medallions, Studs, Sleeve Buttons, Rings and Diamond Settings of all Kinds.

DIAMOND SETTING A SPECIALTY.

694 & 696 Broadway, cor 4th St., New York

(WHITING SILVER MF'G CO.'S BUILDING.)

ALL ORDERS PROMPTLY ATTENDED TO.

WM. C. GREENE & CO.

GOLDSMITHS

MANUFACTURERS of

RICH SETS IN TAPER WIRE CORAL

Amethyst Coral Cameo Stone Cameo Engraved Enamel Sets Brooches Sleeve Buttons Studs Cross &c. Ear Drops &c.

Factory 95 PINE ST. Providence, R. I.

New York Office 18 JOHN ST.

J. EUGENE ROBERT,

IMPORTER OF WATCHES, &c.

SOLE AGENT FOR

LONGINES WATCH CO. The pioneer factory of Switzerland for machine-made Watches on the system of regular sizes and interchangeable parts.

All Goods fully Warranted.

Registered Trade Mark.

LOUIS AUDEMARS, Highly finished and celebrated Ste m-winders and Complicated Watches.

Highest Premiums at all Exhibitions.

"AGASSIZ," Small sized Stem-Winders. A SPECIALTY.

Registered Trade Mark.

No. 9 BOND STREET, NEW YORK.

HENRY GINNEL,

Importer of Swiss Watches,

TOOLS AND MATERIALS, SILK GUARDS, &c.

And Jobber in all grades of American Watches.

No. 31 MAIDEN LANE,

P. O. Box 2967. NEW YORK.

In addition to our line of **SWISS KEY AND STEM-WINDING WATCHES, and Materials of all kinds,** we have a large stock of the celebrated **PIONEER Stem-Winding and Stem-Setting Watches** (manufactured expressly for us) and pronounced by competent workmen to be the best watch for the money in the market. They are cased in silver and German silver hunting or opened faced. **Send for Prices.**

Full Trade Discounts on American Watches.

E. J. DERAISMES. H. A. DERAISMES.

DERAISMES BROTHERS,

Successors to L. A. LUTZ & LUTZ BROTHERS,

MANUFACTURERS AND IMPORTERS OF THE

LUTZ BROTHERS, L. A. LUTZ, PERRET & CO., And A. HUGUENIN-NARDIN

WATCHES.

Fine Movements a SPECIALTY. ¼ seconds, Chronographs and Extra Fine Silver Watches always in Stock. Goods sent on approval, satisfactory N.Y. City references being furnished.

No. 182 BROADWAY,

P. O. 2639, NEW YORK.

FACTORY, Rue des Envers, Locle, Switzerland.

MATHEZ

Watch Company,

Of NEW YORK.

Gents' and Ladies' Stem-Winding Movements

STRAIGHT LINE, 3-4 PLATE NICKEL.

These Movements are of six different grades, uniform in size and beautifully finished, and will be SOLD AT LOWER PRICES than any other goods of similar excellence.

☞A FULL LINE of materials for our movements always kept in stock for the convenience of those using our goods.

F. H. MATHEZ, Sole Agent,

No. 5 Maiden Lane, New York.

TELL A. BEGUELIN,

(Successor to the late GINNEL & BRO.)

Importer of Watches

WATCH MATERIALS, TOOLS AND GLASSES,

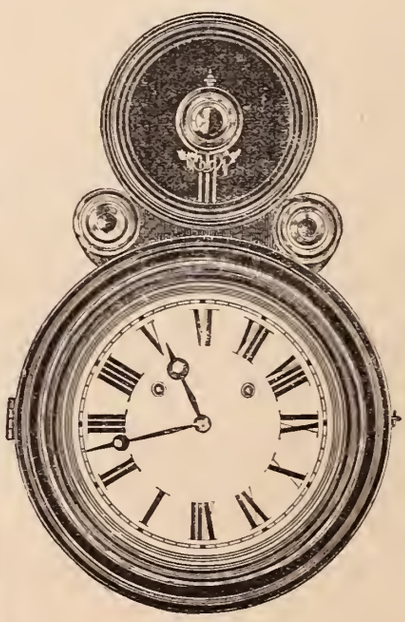
No. 71 NASSAU STREET,

(UP STAIRS),

CORNER JOHN STREET **NEW YORK.**

Sole Importer of the TELL A. BEGUELIN'S BEST MAINSPRINGS.

☞Every description of Watches carefully repaired for the Trade.



E. INGRAHAM & CO.,

Bristol, Conn.,

MANUFACTURERS OF

American Clocks,

Of Every Description.

W. A. & E. HOUSE,

No. 8 CORTLANDT STREET,

NEW YORK.

J. A. BROWN & CO.

OFFICE AND SALEROOM: No. 11 Maiden Lane, N. Y.
FACTORY: No. 104 Eddy St., Providence. R. I.

SOLE MANUFACTURERS OF THE

Ladd Patent Stiffened Gold Watch Cases



For the Movements of the various American Watch Co.'s, in full and three-quarter plate, Gent's, Ladies' and Boys' sizes, Key and Stem-Winders, and in the following styles. BASCINE, FLAT-BEVEL and MANSARD, (this latter as originally named, modeled and introduced by them) forming the most complete and varied line of elegant Cases ever offered for sale. It is now ten years since these Watch Cases were introduced to the public, during which period of time they have steadily gained in popular confidence and esteem. Made of thick plates of Gold and Nickel Composition, thoroughly welded together and rolled to the required thickness—they are, while equally handsome—stronger and more durable than the finest Solid Gold Cases of the same thickness of metal, and at ONE-THIRD or ONE-HALF the COST, and with good movements, they make the cheapest, most elegant and serviceable Watches in the market. The critical examination of these goods by the trade and public is invited with entire confidence that the verdict of approval of their merits will be unanimous now, as ever before.

FOR SALE BY JEWELERS GENERALLY.

☞Dealers can obtain them of the Wholesale Watch and Jewelry Houses, or their Traveling Agents, throughout the United States and British Provinces.

☞All genuine Watch Cases of our manufacture, have "G. W. Ladd's Patent, June 11th, 1867," stamped upon the side band underneath the glass bezel.

Refuse all others. Send for full Descriptive Circular.

TO THE TRADE.

We desire to call the attention of the Trade to our new importations of WATCHMAKERS' AND JEWELERS' TOOLS AND MATERIALS, of all kinds; also to our line of Swiss WATCHES, especially adopted to the requirements of all classes of trade.

Our stock of WATCHES comprises the names of Henry Beguelin Droz & Perret, N. Robert, and other well-known makers whose productions have achieved a high reputation in this market.

We are also dealers in all grades of AMERICAN WATCHES, on which we give the FULL *Trade Discount.*

We would especially direct attention to our "CENTENNIAL" WATCHES, of our own make, Stem-winding and Stem-Setting, cased in silver and German silver, and an excellent and accurate timepiece. Send for Price List.

☞ *A full line of Rogers & Bro.'s Plated Gods.*

CROSS & BEGUELIN,

No 21 MAIDEN LANE, NEW YORK.

NATHAN E. MORGAN. CHAS. B. HEADLY.

MORGAN & HEADLY,

MANUFACTURERS OF

GOLD SPECTACLES,

FINE JEWELRY, CHAINS, BRACELETS,

18 Karat Plain Rings, &c.

Artisan Hall, 611 & 613 Sansom Street,

PHILADELPHIA.

☞A full line of *DIAMONDS,* mounted and unmounted, always on hand, which we will send on aproval to the Trade, on receipt of reference.

LOUIS A. SCHERR. CHAS. H. O'BRYON. G. W. SCHERR.

LOUIS A. SCHERR & CO.

Importers and Wholesale Dealers in

Watches, Jewelry,

WATCH MATERIALS, TOOLS, GLASSES, &C.

Spectacles, Silk Guards, &c.

Wholesale Agents for American Watches.

No. 726 CHESTNUT STREET,

FIRST FLOOR,

PHILADELPHIA.

I. PFORZHEIMER. D. KELLER.

PFORZHEIMER & KELLER,

IMPORTERS OF

Watches and Diamonds

Dealers in American Watches,

AND

Manufacturers of Jewelry,

No. 24 JOHN STREET,

P. O. Box 4144. NEW YORK.

ESTABLISHED 1845.

SALTZMAN & CO.

MANUFACTURERS AND IMPORTERS OF

Fine Swiss Watches



SOLE IMPORTERS OF THE

AUGUSTE SALTZMAN
VICTOR VUILLAUME
ALBERT VUILLE
} Watches

SPECIAL NOTICE.

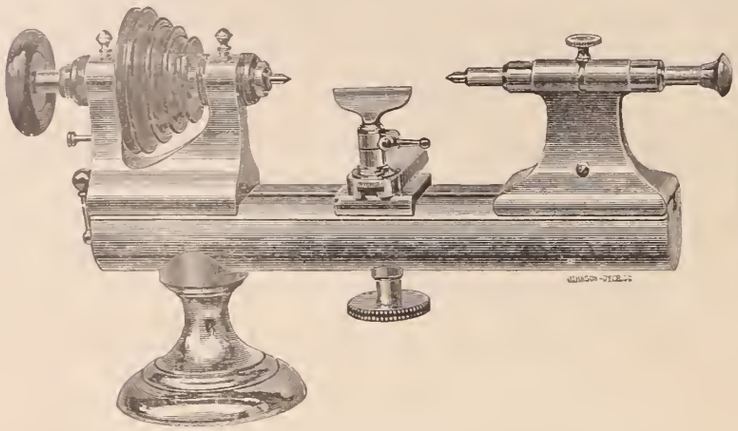
The Trade is respectfully notified to beware of imitations of the name of Saltzman, marked on Watches of an inferior grade, and purporting to be the genuine Saltzman.

No. 15 Maiden Lane, New York.

American Watch Tool Co.

Formerly J. E. Whitcomb & Co.

Manufacturers of Watch & Chronometer Makers' Tools.



P. O. Box 999. WALTHAM, MASS

ROSKOPF WATCH.

J. D. HUGUENIN & CO.,

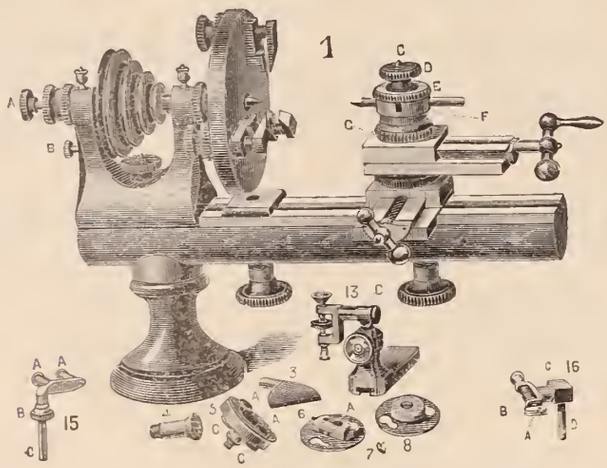
GENERAL AGENTS,

No. 12 Maiden Lane, New York.

The reputation of this Watch as an accurate timekeeper is fully established, and during the ten years that it has been before the Trade, has won an abiding reputation for fine Time-keeping qualities, and the BEST WATCH for the money in the world.

☞Send business card for price list..

HOPKINS' WATCH TOOL CO.



Manufacturers of **HOPKINS' PATENT WATCHMAKERS' TOOLS**, embracing Plain and Combination Lathes, Chucks, Slide and Swing Rests, Gear Cutters, Pivot Polishers, Jeweling and Staking Tools, &c.

Illustrated circulars sent on application.

HOPKINS' WATCH TOOL CO., Waltham, Mass.



WELCH & MILLER,

MANUFACTURERS OF

Jewelry Cases,

In Morocco Velvet, Satin, Rosewood & Black Walnut,

—ALSO—

SILVER-WARE CASES,

No. 169 BROADWAY,

NEW YORK.

☞Rosewood and Black Walnut Show Case Trays. Velvet Cases for Diamonds a specialty. Catalogues sent on application.

Medal and Diploma of Merit Awarded by Centennial Com.

S. C. JACKSON,

MANUFACTURER OF FINE

CASES

For Jewelry, Silver Ware, Trays, &c.

180

BROADWAY,

NEW YORK.



EDWARD TODD & CO.

MANUFACTURERS OF

GOLD PENS,



Pencil Cases, Tooth Picks, &c.

No. 652 BROADWAY,

Factory, 29 & 31 South 11th St., Brooklyn. NEW YORK.

H. HOWARD. A. NICOUD. A. J. SCHERRIEBLE.

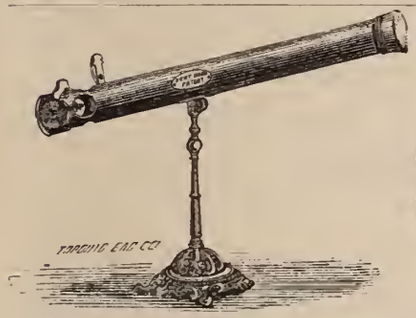
H. HOWARD & CO.,

MANUFACTURERS OF

Fine Gold Jewelry

No. 14 JOHN STREET, New York.

☞ Factory, 102 Orange Street, Providence, R. I.



L. BLACK & CO.'S

Spectacle Indicator

Patented in U. S. July 31, 1877.
Canada, March 19, 1877.

Instruct the customer to place one eye closely against the open end of the tube; put the smallest letter opposite the small hole, and turn until the customer can distinguish a letter or figure. The strength of the spectacles required will be indicated on the index wheel. If the large letters are used, pull up the slide; if not, keep it down.

This instrument is easily adjusted, can not get out of order, is nickel plated, makes a nice appearance, and shows the correct number of lens required

☞ For particulars, address **L. BLACK & CO., Detroit, Mich.,** or any wholesale Optical Establishment in New York.



In placing these Oils before the Trade, we do so with entire confidence, from many years' experience in procuring them from the fish, and in their preparation for use, and more than all, the thorough and SEVERE TESTS they have been subjected to in use upon Chronometers in our whale ships, often absent from fifty to sixty months. ☞ Liberal samples furnished on application.

Dealers in Watches

And DIAMONDS,

OPPENHEIMER, BROS. & VEITH,

Manufacturing Jewelers,

No. 35 MAIDEN LANE,

[Formerly 23],

S. Oppenheimer, A. Oppenheimer, New York. Henry F. Veith, Gus. F. Veith.

MILNE & JOURDAIN,

Manufacturers of Stem-Winding Watch Crowns



13 & 15 Franklin Street, NEWARK, N. J.

Gold Crowns, for Stem-winding Movements, to suit all sizes of Imported or American Watches, in four different styles and seven sizes.

Gold Pushers for Key Movements in every size. Also Gold Crowns for fine Chronograph Watches made to order.

☞ Silver Stem winding Crowns and Key Pushers on hand or made to order. Send for card and samples.

A. MILNE. A. JOURDAIN.

MANUFACTURERS OF EXCLUSIVELY

BLACK ONYX GOODS,

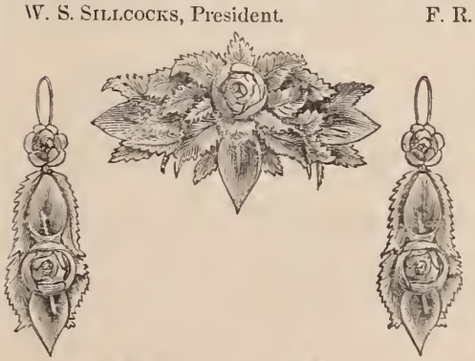
WOGLOM & MILLER,

32 & 34 JOHN STREET,

NEW YORK.

Celluloid Novelty Co.

W. S. SILLCOCKS, President. F. R. LEFFERTS, Sec'y and Treas.



MANUFACTURERS OF

IMITATION

Coral Jewelry.

4 Maiden Lane, New York.

☞ Our goods are for sale by all the leading Jobbers in the country

T. B. BYNNER,

IMPORTER AND JOBBER OF

WATCHES,

DIAMONDS AND FINE JEWELRY,

AND DEALER IN THE

BEST CLASS OF ROLLED PLATE JEWELRY

—AND—

Key and Stem-Winding American Watches,

No, 513 BROADWAY, NEW YORK.

BOOZ & THOMAS,

MANUFACTURERS OF

Watch Cases & Jewelry,

108 SOUTH EIGHTH STREET,

Second Story. PHILADELPHIA,

Illustrated Catalogues sent upon application.

Old Gold & Silver Bought or Exchanged.

PARTICULAR ATTENTION PAID TO REPAIRING.

H. Muhr's Sons, Philadelphia.

MANUFACTURING JEWELERS,

Solid Gold Finger Rings of Every Description.



Crown, 18k. Lion.



On and after January 1st. 1876, our make of Filled Plain Rings will be stamped as above, which stamp is copy righted. Any and every infringement on the above Trade Mark will be dealt with according to law. ☞Every one warranted.

THESE GOODS ARE SOLD BY ALL THE LEADING JOBBERS!

Should the house that any retailer deals with not have them we will furnish them with the address of the nearest Jobber. ☞SELL TO THE JOBBING TRADE ONLY!

New York Office, 11 Maiden Lane.

☞ Address all communications to Philadelphia.

CRYSTAL CHANDELIERS,

Gilt, Bronze and Decorated Gas Fixtures,

FINE MARBLE AND BRONZE CLOCKS,

Bronze Figures and Ornaments in Greatest Variety, at Low Prices,

MANUFACTURED BY

Mitchell, Vance & Co.,

Nos. 836 & 838 Broadway, New York.

"Medal of Special Award," by American Institute, 1872.

No. 719, GAS FIXTURES.

MITCHELL, VANCE & Co., 597 Broadway, N. Y.:

"We find the above-mentioned Fixtures and Glass Chandeliers, for design, excellance of workmanship and finish in all their parts, to be the best production in the country and we may say, in our judgment, excelled by no other country in WORLD.

"We recommend a MEDAL OF SPECIAL AWARD for CHANDELIERS and GAS FIXTURES. (Signed) JOHN W. CHAMBERS, Secretary.

Medal of Special Award confirmed.

FREUND, GOLDSMITH & CO.



IMPORTERS OF

WATCHES,

Jewelry and Precious Stones.

No. 8 Maiden Lane,

NEW YORK.

☞P. O. Box 1143

SOLE AGENTS FOR THE CELEBRATED A. SCHNEIDER WATCH, DRESDEN.

ESTABLISHED 1854. ☞Medal and Diploma Awarded at Centennial Exhibition.

JUDGES' REPORT:—Well made and good patterns—Double Hinge as a useful improvement.

(Patented December 17th, 1867.)



G. F. KOLB & SON,

MANUFACTURERS OF FINE

Morocco, Velvet and Cabinet Cases,

FOR JEWELRY, WATCHES & SILVERWARE.

TRAYS FOR SHOW CASES, TRUNKS, &C.

732 Sansom Street, PHILADELPHIA.

D. LIECHTY. B. LEVY

D. LIECHTY & CO.

MANUFACTURERS OF

Gold & Silver Watch Cases,

IMPORTERS AND DEALERS IN

SWISS & AMERICAN WATCHES,

No. 402 Library Street,

PHILADELPHIA.

C. F. A. HINRICHS,

29, 31 and 33 PARK PLACE,

Cor. of CHURCH STREET, (Up-stairs) NEW YORK

Successor to M. WERCKMEISTER.

[ESTABLISHED 1801.]

IMPORTER AND DEALER IN

FANCY GOODS,

GLASS-WARE,

China, Bronzes, Clocks, Toys, &c.

Sole Agents for the Glass Factories of the Company "ANN," Namuroise, Belgium

Depot for Archery, Cricket & Base Ball Implements.

And C. A. KLEEMANN'S CELEBRATED GERMAN STUDY LAMPS.

Agent for ROGER'S GROUPS in Parian, &c.

Established in 1854.

C. & A. PEQUIGNOT,

Manufacturers of Watch Cases.

DEALERS IN AMERICAN WATCHES, AND IMPORTERS OF FINE KEY AND STEM-WINDING MOVEMENTS.

Salesroom & Manufactory, 22 South Fifth Street,

PHILADELPHIA.

Medal and Diploma awarded at Centennial Exposition for superior mechanical execution and artistic ornamentation

HALL, ELTON & CO.,

Manufacturers of the Finest Electro-Plated Ware.



The "ORLEANS."

UNSURPASSED IN QUALITY, STYLE AND FINISH!

Factories, Wallingford, Conn. Salesroom, 75 Chambers St., New York.

HOLMES, BOOTH & HAYDENS,

MANUFACTURERS OF

ELECTRO-SILVER PLATED

Spoons, Forks, Ladles, Fancy Pieces,

Solid Handle Steel Knives, &c., of the finest quality.

No. 49 Chambers Street, **NEW YORK.**

No. 18 Federal Street, **BOSTON.**

Works at Waterbury, Conn.

Established 1828.

JACOB BENNETT & SON,

Diamond Setters and Manufacturing Jewelers,

No. 108 SOUTH EIGHTH STREET, PHILADELPHIA.

WE MANUFACTURE AND MAKE A SPECIALTY OF EVERY DESCRIPTION OF

DIAMOND MOUNTINGS

SUPERIOR IN DESIGN AND WORKMANSHIP.



MASONIC MARKS,

Presentation & Lodge Jewels,

SOCIETY AND POLICE BADGES MADE TO ORDER.

FINE WHOLE PEARL JEWELRY.

GOODS SENT ON MEMORANDUM TO ANY PART OF THE UNITED STATES.

AMERICAN

WALTHAM WATCHES.

THE LATEST HOROLOGICAL NOVELTY!

WE desire to call the attention of dealers to the latest horological novelty introduced in American Watches, viz.: a WALTHAM WATCH with a

RELIABLE CHRONOGRAPH ATTACHMENT,

OF ALMOST ASTRONOMICAL PRECISION.

This novel feature is introduced in our 14th Size *GENTS'* Stem-Winding and Setting Movements (Gilt and Nickel), and is a FLY BACK, registering Fifth Seconds, controlled from the stem or push pin, responding with marvellous rapidity.

This Chronograph is secured to the back of the movement—has a separate and independent Timing Register concealed under the lid, which is sprung open by depressing the pendent bow, thus relieving the *Time* dial from the complication usually found in imported goods of this character.

In addition to these advantages, it also possesses the *Waltham System of Interchangeability of Parts*, of which finished duplicates, requiring no fitting, can always be had at this office.

The WALTHAM CHRONOGRAPH is constructed on established scientific principles, simple in mechanism, reliable and accurate in performance, and is in every way the most substantial and convenient chronograph timepiece ever invented.

These movements are artistically cased in Hunting and Open Faced Cases.

Very respectfully,

ROBBINS & APPLETON,

No. 9 Bond Street, New York.

Notice to the Trade.

New York, February 15th, 1878.

Our attention has been called to an advertisement in the "Toledo Blade," in which Waltham Watches are offered as premiums to Subscribers.

We desire to state that the advertisement in question is published without our knowledge or consent, and that we POSITIVELY DECLINE to sell to newspapers, grocery houses, patent medicine venders or other outside dealers, any Watch or Movement of our manufacture.

Our goods are made exclusively for the legitimate channels of trade, and are sold only to dealers regularly in the business.

ROBBINS & APPLETON,

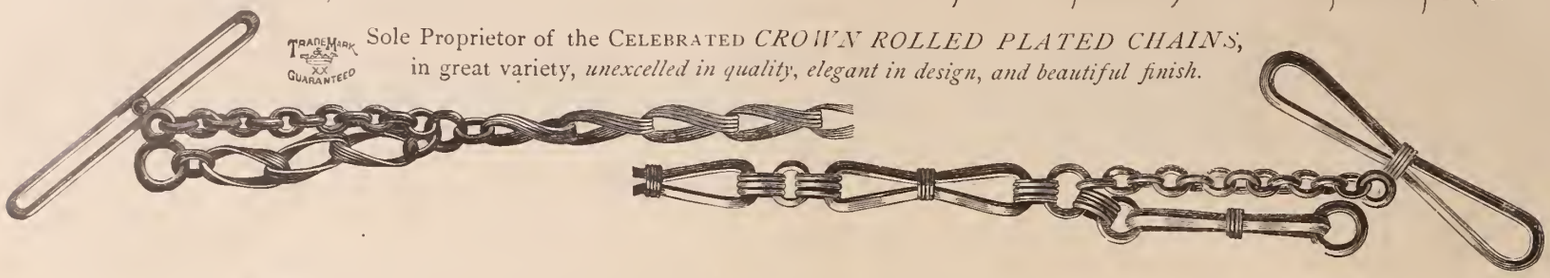
No. 9 Bond St., New York. **No. 8 Summer St., Boston.**

No. 170 State Street, Chicago.

Waltham Building, Holborn Circus, London, England.

HENRY C. HASKELL,

MANUFACTURING JEWELER, NO. 12 JOHN STREET, NEW YORK



Sole Proprietor of the CELEBRATED *CROWN ROLLED PLATED CHAINS*, in great variety, *unexcelled in quality, elegant in design, and beautiful finish.*

☞ *Many new patterns in VESTS, NECK AND GUARD CHAINS for the Spring Trade.*
Orders solicited for SAMPLES *on approval, and if, on receipt, not perfectly satisfactory, return at my expense.*

L. & A. MATHEY,

IMPORTERS OF FINE WATCHES AND MOVEMENTS.



Removed Feb 1st, to 16 Maiden Lane.

Independent ½ Seconds. Plain Chronographs, Independent Split Seconds,
Minute Repeaters, Double Chronographs, Perpetual Calendars,
Minute Chronographs, Pocket Chronometers.

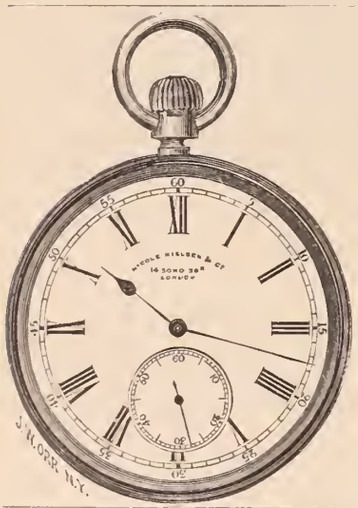
MINUTE CHRONOGRAPHS, WITH MINUTE REPEATER.
CHRONOGRAPHS, WITH MINUTE REPEATER.
AND A FULL LINE OF MEDIUM GRADE WATCHES AND MOVEMENTS.

Sole Agents for the H. L. MATILE WATCHES.

☞Timing and Complicated Watches a specialty. All our Watches are tried and tested before delivery. ☞Goods sent for examination on satisfactory references.

"TIME AND TIME-KEEPERS," an interesting essay on the rise and progress of Watch-making, sent free to any address on application.





BARTENS & RICE,

No. 3 JOHN STREET, NEW YORK.

Importers of Watches,

Watch and Chronometer Makers.

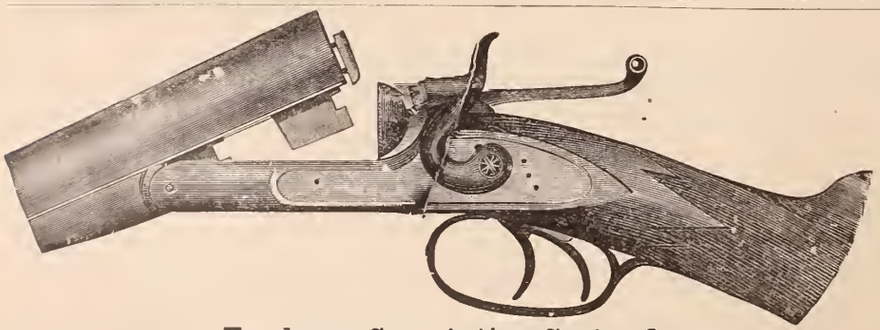
WATCHES OF OUR OWN MAKE.

SOLE AGENTS FOR THE

NICOLE, NIELSEN & CO., LONDON WATCHES, AND FOR THE STAR WATCH COMPANY, GENEVA.

☞ Medals and Diplomas at the International Exhibitions in London '62, Paris '67, Vienna '72, Philadelphia '76.





Top-lever, Snap Action, Centre-fire.

REMINGTON'S

Breech-Loading Doubled-Barrelled GUN.

Prices: Steel Barrels, $45; Twist Barrels, $50, $60; Laminated Barrels, $75; Damascus Barrels, $85. Discount to Dealers.

☞The best ever offered the American Sportsman, combining all the most desirable features of the best imported, together with some valuable improvements not found in any other.

FOR SALE BY THE TRADE EVERYWHERE.

[From the ROD AND GUN, Nov. 18th, '76.]

THE REMINGTON GUN.—Judge H. A. Gildersleeve, of the American Rifle Teams, 1874, 1875, and 1876, thus writes under date of November 10th.—I have just returned from the Big Sonth Bay, where I have been gunning for ducks. I tried for the first time the Remington 10-guage gun I purchased from you last summer. My success with it was excellent. In my judgment its shooting capacity cannot be surpassed. I want no better gun, and if I did I don't believe I could find it, even among the expensive grades of English guns.

H. A. GILDERSLEEVE.

☞**Manufactured by E. REMINGTON & SONS, 281 and 283 Broadway, New York.** P. O. Box 3,994. Armory, Ilion, N. Y. Cut this out and send for Illustrated Catalogue and Treatise on Rifle Shooting. ☞CHICAGO, 237 State Street; BOSTON, 149 Tremont Street; BALTIMORE, 47 North Charles Street; ST. LOUIS, 609 North Fourth Street.

NICOUD & HOWARD,



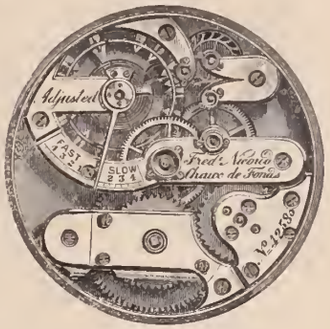
Importers of Fine Swiss Watches,

No. 14 JOHN STREET, NEW YORK.

TRADE MARK.

NICOUD WATCH

N.F.N.



Factory, 12 Rue St. Pierre, Chaux de Fonds, (Suisse.) Established 1847.

Sole Importers of the FRED NICOUD / ARNOLD NICOUD WATCHES.

All Watches fully warranted as to quality of Movements and Cases.



BIRCH'S PATENT

Self-Adjusting Watch Keys.

FOR SALE BY THE TRADE GENERALLY.

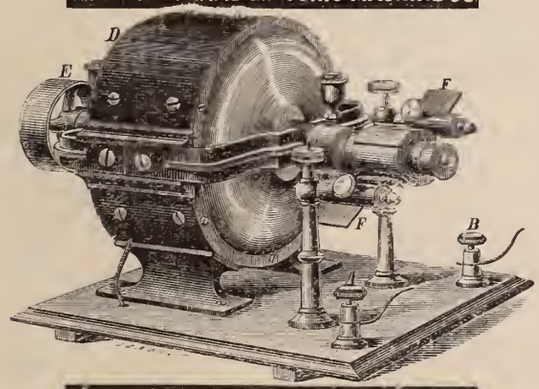


Patent articles made by Contract or on Royalty.

J. S. BIRCH & CO.,

No. 38 Dey Street, New York

WESTON DYNAMO-ELECTRIC MACHINE CO



CONDIT, HANSON & VAN WINKLE
Sole Agents *NEWARK, N.J. U.S.A.*

Machines for Electro-Plating, Electrotyping, Electric Light, Telegraphing, &c.

The Weston Dynamo-Electric Machine is constructed on an entirely new principle giving the greatest amount of electricity with the least consumption of power. Its simplicity and ease of management has already made it the standard machine. The success attending its introduction has already had the effect of inducing parties building machines for similar uses to adopt some of the devices peculiar to our new construction. We beg to call attention to the various patents covering our machines, and to the fact that we guarantee purchasers against any infringement of existing patents, as well as to their adoption and endorsement by the largest manufacturers of the country, in many cases after a previous trial of all other machines.

THE MERIDEN BRITANNIA CO.,
WEST MERIDEN, CT., March 20, 1877.

MESSRS. CONDIT, HANSON & VAN WINKLE, Newark, N. J.

GENTLEMEN: You may send the two machines as proposed. I will say in regard to them they are splendid machines, and will say to any party you may refer to us that I shall advise them to take no other at any price, as yours is the best in my judgment, as we tried one, kept it, and took out all our old machines and replaced them with two of yours (making three 12 inch machines in all). Just say to your customers we refer you to the largest Plating Works in the world. Yours truly,

H. C. WILCOX, President Meriden Britannia Co.

In addition to the testimonials in our Catalogue of January 1, we beg to refer to the following houses: Carter, Howkins & Sloan; Enos Richardson & Co.; Bates & Bacon; Short, Nevney & Co. Stephen Richards & Co.; Meriden Britannia Co.; Russell & Erwin M'f'g Co.; Reed & Barton; Hall, Elton & Co.; Richardson, Boynton & Co.; Wm. H. Jackson & Co.; Stanley Works; Rogers Cutlery Co.; Chas. Rogers Bros.; Edward Miller Co.; Mitchell, Vance & Co.; Norwalk Lock Co.; Hayden, Gere & Co.; Domestic Sewing Machine Co.; Eberhard Faber; Jos. Dixon Crucible Co.; Mumford & Hanson; Fagan & Son, and over 200 others. Outfits for NICKEL, SILVER, BRONZE PLATING, etc. The two highest Centennial Awards, and three of the Centennial Medals of American Institute.

REED & BARTON,

MANUFACTURERS OF FINE

Electro Silver Plate

Are now manufacturing for the Holidays,

A LARGE NUMBER OF NEW DESIGNS

Of Every Variety of Table Ware,

—SUCH AS—

DINNER, TEA AND WATER SETS, ICE PITCHERS WITH PATENT CHINA LININGS, CAKE BASKETS, KNIVES, FORKS AND SPOONS.

Also of Ornamental Pieces, such as Vases, Jewel-Boxes, Card-Stands and Cases, Toilet Sets, Statuettes, &c.

Salesroom, No. 686 BROADWAY, New York.

Factory, Taunton, Mass.



SPRING TRADE, 1878.

J. C AIKIN, H. A. LAMBERT, J. B. SHEA.

AIKIN, LAMBERT & Co.,

MANUFACTURERS OF



Gold Pens, Pencil Cases, Holders, Pencils, Picks.

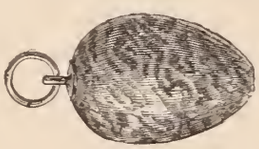


12 MAIDEN LANE, New York,

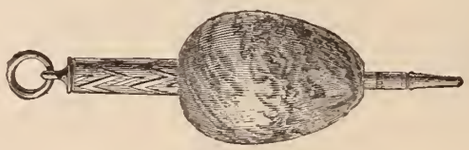


Awarded the **Highest Premium** at Centennial Exposition for **Superiority** of Gold Pen and Pencil Cases, etc. Manufacturing only RELIABLE Goods, and introducing each season Novelties in the way of Improved Patents, we are enabled to offer superior advantages to those who appreciate First Class Goods.

Our system of furnishing Show Case assortments, and establishing agencies, is broad, liberal and advantageous, and, as the originators of that method of display, now so popular with the Trade, we are offering liberal inducements to Agents. Prices recently reduced.



CLOSED.



OPEN.

Patent Egg Pencil Charms, the Latest Novelty.

Illustrated Catalogues and Price Lists furnished upon application. Correspondence invited.
Goods sent on approval when desired.

IMPORTERS OF

All Grades of Watches.

SOLE AGENTS FOR

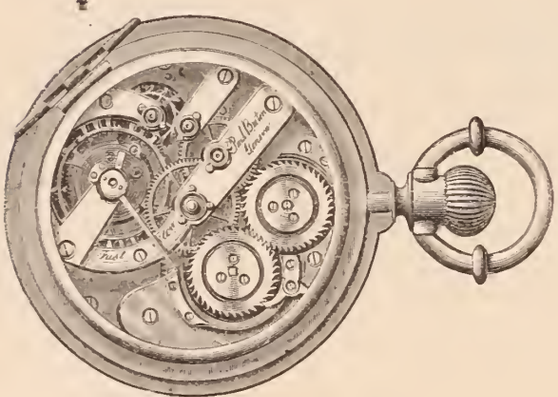
"PAUL BRETON" & "CHAS. LATOUR,"

GENEVA.

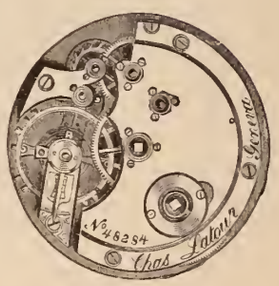
SPECIALTIES;

ACCURATE TIMEKEEPERS

at Reasonable Prices, Quality considered.



First Quality 19 Line.
60 dwt. Hunting Case.



First Quality 17 Line.
Fitting Ladies' Waltham Case

CHAS. LATOUR MOVEMENTS, Nickel, Key-Winding, fitting 16 size Waltham cases. CHAS. LATOUR MOVEMENTS, Gilt and Nickel, Key Winding, all of superior quality, fitting Ladies' Waltham Case. AGASSIZ Movements, Gilt and Nickel, Stem-winding, fitting Ladies' "Riverside" Case. Metal Cased Open Face STEM-WINDERS, "LONGINES" and "EXCELSIOR," good timers, at low prices.

Ladies Watches, of tasty designs of casing, and reliable as timekeepers, IN GREAT VARIETY.

Gent's Watches, in cases of finest workmanship, and the most approved styles, from the finest quality (surpassed by none), to the lowest that can be relied on for time.

A large variety of moderate priced **SILVER WATCHES**, Hunting and Open Face, Key and Stem Winding, Gilt and Nickel Movements. Also **FINE MOVEMENTS** in Silver Cases. The PAUL BRETON Watches have been introduced into this country for the past 15 years, and have established a wide reputation solely on their merits as time keepers The lowest grades in Silver Cases are all well made and finely finished, for the special purpose of giving accurate time at a moderate price and are much superior to any American watch of the same cost. The finer qualities are unexcelled by any watches in the market, of similar price. We have a full line of all grades and styles, Hunting and open face, Key and Stem winding, Gilt and Nickel movements, Gold and Silver Cases; and dealers desiring a first class article at a moderate price, will do well to call or address us.

We Guarantee all Watches Sold by us.

AMERICAN WATCHES of all the companies at lowest Trade rates. **GOLD CASES** of all styles and the best workmanship, made to order.
☞LADIES' CASES, with Patent Adjustable Cap, by which the same case fits Waltham or Elgin movements. ☞SOLE AGENTS for PNEUMATIC TIMER.
Goods sent on approval to responsible parties. PRICES TO SUIT THE TIMES.

As Manufacturing Jewelers we continue to furnish our usual large and varied assortment of **Staple** and **Novel Styles** in **SOLID GOLD** and **ROLLED PLATE.** A large assortment of **STONE RINGS, BAND RINGS,** including Cameo, Onyx, Topaz, Amethyst, Garnet, Pearl and Diamonds. Necklaces, Lockets and Crosses, Gold and Silver Thimbles, etc. Special attention given to **ORDERED WORK.**
Those not acquainted with us will oblige BY GIVING REFERENCE WHEN ORDERING.

GOODS SENT ON APPROVAL

TIFFANY & CO.,

MAKERS OF

FINE AND COMPLICATED WATCHES.

TIFFANY WATCHES (for Ladies and Gentlemen,) 3-4 Plate and Bridge Movements.

MINUTE REPEATERS,

FIVE MINUTE REPEATERS,

QUARTER HOUR REPEATERS,



INDP'T FIFTH SECONDS,

INDP'T QUARTER SECONDS,

CALENDARS (Perpetual).

REPEATERS WITH CHRONOGRAPHS, &c.

CHRONOGRAPHS.

FLY-BACKS.

Single, Split-Second, Minute and Second, and with Repeaters.

THE TIFFANY CHRONOGRAPHS are conceded by all to be the most accurate and reliable *TIMING WATCHES*, and very generally used for sporting and scientific requirements.

The STANDARD TIFFANY WATCHES are constructed upon the most approved scientific principles, combining simplicity, strength, durability, and time-keeping qualities.

The simplicity of construction renders them less liable to get out of order than more complicated Watches, and reduces the cost to the minimum at which Watches of the same grade can be produced.

☞ *Goods sent for selection or examination and Price Lists forwarded on receipt of satisfactory references. Orders for engraving, ornamenting or refinishing nickel movements, and engraving inscriptions, devices, and monograms on cases promptly attended to.*

Works at Geneva, Switzerland.

Wholesale Office, 14 John Street, New York

GEO. R. COLLIS, Manager.

☞ **We are General Agents for Messrs. Patek, Philippe & Co., Geneva, Switzerland, a full line of whose Watches will be found at our Wholesale Office, 14 John Street.**



OFFICE OF

C. G. ALFORD & CO.

MANUFACTURING JEWELERS,

183 BROADWAY.

New York, February 15th, 1878.

TO THE TRADE.

We desire to state to those who have favored us with their patronage that we propose to keep them advised of new and attractive designs of

PLATED AND GOLD JEWELRY,

as they from time to time appear in the market. To that end we shall present for your inspection, in the **March number of the Circular,** *several pages representing examples of the latest novelties in jewelry. These pages will be inserted in such a manner as to be easily detached from the Circular, and placed in our Catalogue of Designs, thus supplying a useful supplement to the same.*

We think our friends will appreciate our efforts to keep them informed of the changes in the market, as it will enable them to order as intelligently from our Catalogue of Designs, as though they made the selections from our stock in person.

Those who desire a copy of our Catalogue must enclose business card, as this work is designed exclusively for the legitimate trade, and will in no case be sent to outsiders.

Very respectfully,

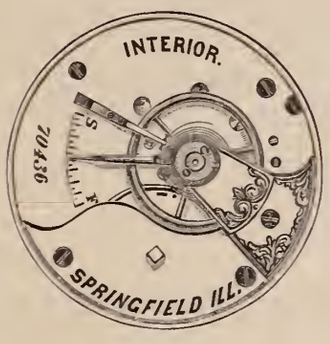
C. G. ALFORD & CO.

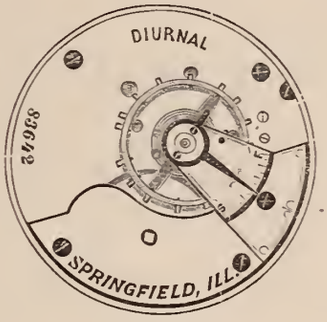
ILLINOIS

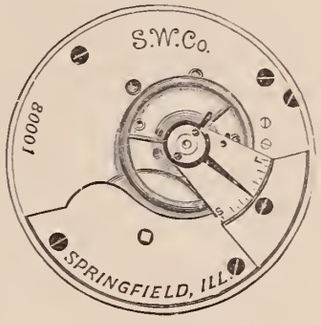
Springfield Watch Company,

MANUFACTURERS OF

KEY AND STEM-WINDING MOVEMENTS.







ALL GRADES GILDED THROUGHOUT, AND HAVE HARD PLATES.

The above grades are again reduced in price, February 1st, and are guaranteed to be

THE MOST DURABLE LOW-PRICED MOVEMENTS IN THE MARKET!

Special attention is called to the fact that this Company furnishes no Movements or Watches, on any terms, to Newspapers or Periodicals with which to interfere with sales of regular dealers.

☞ *Please apply to your nearest wholesale dealer for price list.*

OFFICES.

11 MAIDEN LANE,
New York.

172 STATE STREET,
Chicago.

SPRINGFIELD, ILLS.

ESTABLISHED 1859.

ERRICO BROTHERS,

IMPORTERS AND MANUFACTURERS OF

Coral, Silver Filigree and Conch Shell Jewelry,

Of New and Beautiful Designs.

No. 19 JOHN STREET, NEW YORK.

Manufactory, 39 St. Catarina a Chiaja, Naples, Italy.

CORAL JEWELRY.—Our stock of Coral is unusually complete and attractive, embracing the widest range of styles, patterns and shades, peculiarly desirable for the requirements of this market, while our assortment of loose goods for manufacturing purposes is almost illimitable.

SILVER FILIGREE.—We would call the special attention of buyers to this line of goods. Our stock is one of the most complete and varied to be found in the city, and consists of Combs, Necklaces, Lockets, Pins, Ear-rings, Hair-pins, Charms, &c., in almost endless variety.

CONCH SHELL.—Of which we have a great variety of the most artistic designs, either mounted or unmounted. They are very desirable goods, and are competing with the finer class of stone cameos.

CONCH SHELL & ONYX.—The latest novelty introduced by us this season is a pleasing combination which promises to become exceedingly popular.

BUYERS VISITING THE CITY ARE CORDIALLY INVITED TO EXAMINE OUR STOCK.

J. LAURENT,

MANUFACTURER OF

Gold and Silver WATCH Cases,



Laurent's Pat
"Oval Scolloped" Ladies' Case.

17 John Street, New York.

(ESTABLISHED 1861.)

TRADE MARK.



"Round Scolloped" Ladies' Case

An EXTRAORDINARY REDUCTION IN PRICES to Cash Buyers is announced; also an important improvement in my Cases, which are now made with my NEW PATENT LIFT AND CATCH SPRING combined, having two lift Springs in place of one only as in other Cases.

Gold Cases guaranteed by Special Certificate to be full quality throughout, as represented.

Prices and NEW CATALOGUE OF DESIGNS sent to dealers upon application with business Card.



BOSS'

PATENT STIFFENED

GOLD WATCH

CASES.



NEW YORK OFFICE,

13 JOHN STREET.

Philadelphia, January 1st, 1878.

MESSRS. HAGSTOZ & THORPE *use this medium of thanking the Trade for the patronage bestowed upon them and for the encouragement received in acknowledgement of the recent great improvements in*

Boss' Patent Stiffened Gold Watch Cases.

The present year shall be no exception to the past in this respect, very decided improvements being made both in the manufacture and ornamentation, adding materially to the cost which it is hoped will be met by largely augmented sales.

To diffuse a knowledge, and to answer letters, received daily, about the mode of construction, style, finish, durability, &c., they are about to issue a handsomely Illustrated Catalogue for distribution by the retail trade to their customers, (no prices will be given).

Any dealer selling **Boss' Patent Cases** *will be supplied with the Catalogues, with his name printed on the front page, free of charge, by sending his business card through the jobber from whom he buys.*

Respectfully,

HAGSTOZ & THORPE.

GORHAM MANUFACTURING CO.

SILVERSMITHS,

NEW YORK AND PROVIDENCE.

Manufacturers of Sterling Silverwares of the highest character and in all branches of the art. Also makers and sole Proprietors of the GORHAM PLATED WARES, so well and favorably known to all dealers. In Silver Goods our stock is unusually complete and attractive, embracing an extensive assortment of Silver Hollow Ware, of exquisite design and finish, comprising large single pieces for presentation purposes, and complete services in Tea, Dinner and Dessert Ware, etc., and from which we can supply *immediately* any demand by *mail* or *telegraph*.

Dealers availing themselves of these advantages are enabled to offer customers a select display of goods, which often results in large sales. We would call attention to our lithographic circular on another page of this Journal, containing two of our latest designs in Spoons and Forks. Each of these patterns has artistic merits that especially recommend them to the best class of trade.

ILLUSTRATED CIRCULARS, showing our complete line of Spoon Patterns, together with price and weight list, will be sent to the Trade *only*, upon application. We are now making the largest line of successful patterns of spoons and forks on the market, and our business in these goods, for the past season, has exceeded that of any previous year. All Solid Silver Goods of our manufacture are GUARANTEED absolutely to be of the English Standard, $\frac{925}{1000}$ fine.

GORHAM PLATED WARE.

This well known ware has been on this market for thirteen years, and has won an abiding reputation as the Standard ware of this City. These goods are made of Hard Metal, *Silver Soldered throughout*, and very heavily plated, and is a durable and elegant substitute for Solid Silver. Our object is to produce the *BEST ARTICLE* made in Plated Ware, the cost of production being a secondary consideration. We are enabled to make considerable reductions from former prices. We offer these Wares to the Trade as the most durable and economical Plated Ware made.

Photographs and Prices Furnished.

Hampden Watch Co.

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Manufacturers of all Grades of Movements.

SALESROOM,

No. 12 John Street, New York.

Marble Clocks!

In Great Variety, from $9.00 *(Gold) Upwards.*

Fresh Importations of London, Paris and Vienna Fancy Goods, Bronzes and Articles of Vertu and Ormolu, will arrive in about three weeks. Dealers desiring special articles, by sending their orders, can have them forwarded at once, to our buyer now in Paris.

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No. 3 UNION SQUARE, NEW YORK.

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SIMONS, BROTHERS & CO.

MANUFACTURERS OF

Gold Chain and Jewelry,

611 & 613 Sansom Street,

PHILADELPHIA.

Awarded Medal and Diploma.

CONSOLIDATION!

We would announce to the Trade that the firms of SIMONS, BROTHER & CO., and SPEICKER, SIMONS & BRO., have this day been combined, and will continue under the firm name of SIMONS, BROTHERS & CO., to manufacture all the Specialties for which the two houses have an established reputation. We have made very extensive factory improvements, and will be able to insure our friends that satisfaction which is guaranteed by dealing with a first-class house. Address,

SIMONS, BROTHERS & CO., 611 & 613 Sansom Street, Philadelphia.

Vulcanite Jewelry Co.

MANUFACTURERS OF

WHITBY JET,

Combination Whitby Jet and Vulcanite,

Byron's Patent, May 18, 1869,

Also a full line of Lockets—plain, gold mounted and monogram.

No. 191 BROADWAY, N. Y.

☞ Agents for the NEW RUBBER WATCH CASES, Fitting all American Movements.

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Engraver, Diesinker and Stamper

FOR JEWELRY PURPOSES.

Manufacturer of Shanks and Heads for Seal and Diamond Rings.

Sample Cards always on hand.

☞ **Superior Carved and Fancy Band and Children's Rings, with very elaborate designs, a Specialty.**

☞ Fine Engraving and Enameling Work done.

41 Maiden Lane, N. Y.

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Importer of Fine

Tools for Watchmakers,

CUTTING AND DIVIDING ENGINES.

Rounding-up Tools and Cutters, also Cutters for Stem-winding wheels.

Fine Lathes with the American system of Chucks.

Dividing Engine and Rounding-up tool combined.

MARINE CHRONOMETERS FOR SALE.

Special Tools imported to order.

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Mansard English Geneve Louis XV.



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Stem-Winding Watch Crown Manufacturer,

Crowns and Pushers in gold, all sizes, quality and color, made to order. Silver crowns and pushers always on hand.

☞ Samples sent on application.

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Watch Materials,

TOOLS, GLASSES, SILK GUARDS,

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FIRST FLOOR.

Sole Importer of the A. Hugenin & Gravier Mainsprings

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CAMEO Likenesses,

599 Broadway, New York.

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MANUFACTURER OF

DIAMOND JEWELRY,

169 & 171 BROADWAY,

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Full line of new and original mountings on hand.

Price list furnished on application.

☞ Particular attention paid to Remounting.

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Manufacturing Jewelers.

SPECIALTIES.

Stone Cameos, Onyx, Amethyst, Topaz and Pearl.

☞ Also our new imitation fac-simile of Fine African Diamonds, mounted in Rings, Studs, Pins, Ear-Rings, Collar and Sleeve Buttons, &c.

Leon Jeanne. Paul Jeanne.

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Diamond Mountings And RICH JEWELRY,

Patentees of Jeanne's Ear Wires,

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Designs furnished and estimates given.

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Improved Gold and Silver

THIMBLES



AND THE PATENT

AUTOMATIC EYE GLASS HOLDER,

Which returns the Eye Glasses to their place on or under the lapel of the vest by simply casting them from the nose, combining all the conveniences of Cord, Hook and Case, without their annoyances.

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OF EVERY DESCRIPTION.

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SPECIALTY,

Diamonds, Mounted & Remounted.

JOSEPH B BOWDEN,

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Solid Gold Rings

A SPECIALTY

A Large Assortment of PLAIN, CARVED, PLAIN BAND & CHILDREN'S always on hand. Also

A Full Line of Cameo Sleeve Buttons.

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Sole Makers of the Separable Sleeve and Collar Buttons in Gold.

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Manufacturers and Importers of Watches,

All Kinds of



WATCHES Made To Order.

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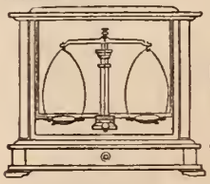
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Manufacturer of Fine Gold Scales,



DIAMOND SCALES,

☞ Bullion Balances and Weights, in use at all the U. S. Mints and Assay Offices.

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Solid Gold Rings---a Specialty

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Viz., Plain, Chased, Engraved, Enameled, Engine Turned, Shield & Scale. *All qualities Warranted*

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THE PORPOISE.

☞This Oil is made from the best of stock, is free from gum or corrosion, will stand the coldest weather, and is every way reliable.

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Chronometer & Watch MAKER,

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☞Repairing of every Description for the Trade.

FINE WATCHES A SPECIALTY.

☞Has constantly on hand a large variety of second hand Marine Chronometers, suitable for watchmaker's use

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Superior Watches,

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Pattern books constantly on hand for the Trade

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PLATINUM

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Native Platinum, Scrap, &c., purchased.

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GOLD PENS and PENCILS of all styles

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Striking Society Medals in Gold, Silver or Bronze

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Fine Hair Jewelry,

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Solid Gold Mountings for Hair Jewelry, kept constantly on hand, and made to order at shortest notice.
Orders from the country trade promptly attended to.

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PATENTED AUG 10 1875

The tool is made of Steel throughout, with the jaws and wearing parts hardened. Every part is made to gauge. The finish is first-class and nickel-plated. Warranted to outwear at least three of the imported pin vises.

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Jewelry and Silverware Cases,

Rosewood and Black Walnut Trays.

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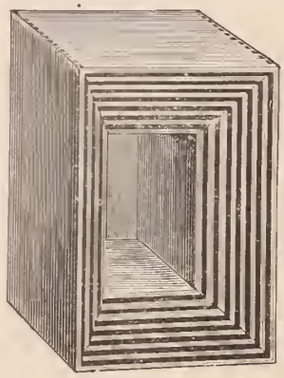
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Manufacturers of Jewelers Wood Nested

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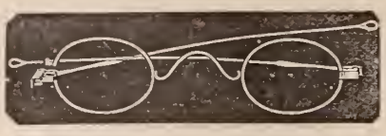
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☞ Orders by mail, promptly attended to.

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IMPORTER AND MANUFACTURER OF

Optical Goods,

No. 36 MAIDEN LANE,

Near Nassau Street, NEW YORK

Sole Agent for

BLACK'S PATENT

Interchangeable Spectacles,

AND

EYE GLASSES.

Jewelers and others who keep spectacles for sale will please observe that, with these PATENT SPECTACLES, it is only NECESSARY to have a full *Complete Assortment of Lenses and Pebbles*, which being all of a UNIFORM SIZE, will FIT either the Gold, Silver, or Steel Frames, of which but a few of each kind are wanted; an advantage which will give a complete assortment of the finest Spectacles, for one-sixth the capital invested in a like assortment of the same quality goods of the old style frames.

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GEO. W. DU BOIS,

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Clock Comp'y,

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Manufacturers of every variety of

American Clocks

And Novelties in Metal, Glass and Wood Cases.

☞ Illustrated Catalogues and Price Lists furnished on application.

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Importers of P. S. STUBS',

French, Swiss, German & Sheffield Tools, Files,

Steel Wire and Materials,

For Watchmakers, Jewelers, Engravers, Die-Sinkers, Machinist, &c.

Turning Lathes, Drills & Chucks

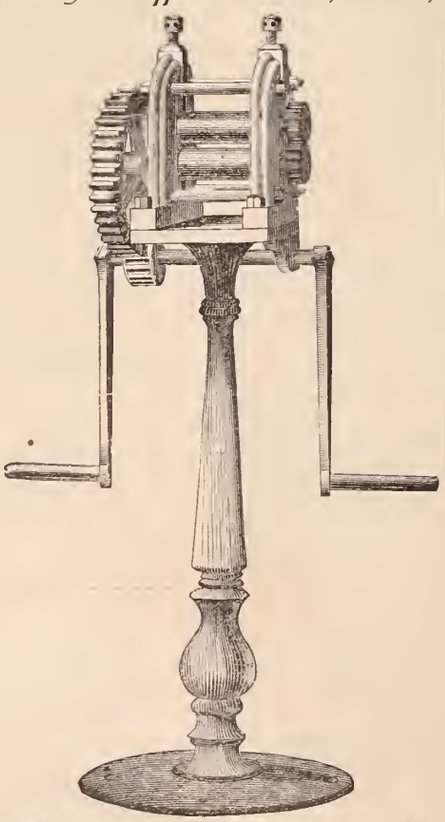
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Ingots,
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Borax,
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No. 62 Chatham Street, Established 1816.

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Kendrick, Davis & Co.,

OWNERS AND MANUFACTURERS OF

Williams & Cook's Dust-Proof Watch Keys,

LEBANON, N. H.

Patented Sept. 1st, 1874.



A C A

PRICE PER GROSS.

The Popular Name Key.

A. Nickel Plated Handle and Pipe, Swivel Top..... $10.75

English Pattern Key.

C. Nickel Plated Handle and Pipe, Swivel Top..... ..... $7.50

If anything different is required for one side of key than, Watch Maker and Jeweler, Watch Makers and Jewelers, Watches and Diamonds, Fine Watches, Fine Watches and Jewelry, Waltham Watches, Manufacturing Jewelers, or for any first order for name key less than one Gross, we make extra charge of $1.50 for Die.

Our Key Pipes are all warranted to be made of the finest quality of steel, and are absolutely dust and moisture proof, constituting by far the best and cheapest key manufactured. Our sizes run from 1 to 10, 1 being the largest size, 4, 5 and 6 being the common sizes for American watches.

☞ For Sale by the Trade generally.

N. B. We have lately made a decided improvement in the Key in fastening the pipe to the handle, as well as the finish generally.

KENDRICK DAVIS & CO., LEBANON, N. H.

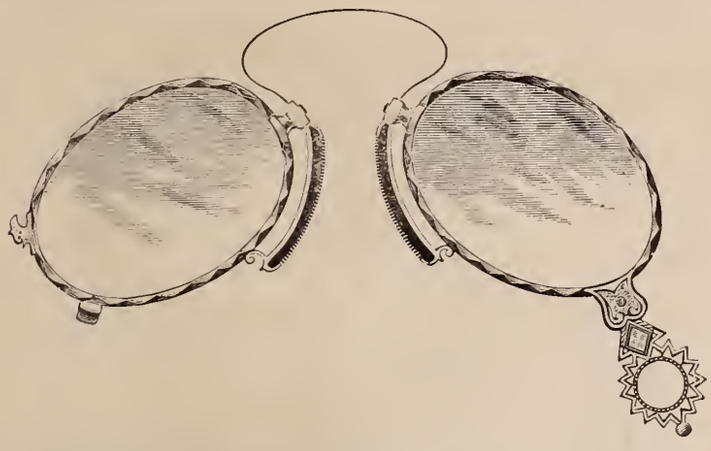
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SPENCER OPTICAL MAN'F'G CO.

MANUFACTURERS OF

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Gold, Silver, Steel & Nickel-plated Spectacles,



Gold, Steel, Rubber, Celluloid and Shell Eye-Glasses,

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Factories, Mt. Kisco, N. Y. NEW YORK.

☞CELLULOID EYE GLASSES in new and desirable styles; the lightest and strongest material ever in use; representing Tortoise Shell, Jet and Amber. These goods are *now* mounted with metal springs. It is much more durable than shell or rubber; will not turn gray; has no sulphur in it, consequently will not tarnish jewelry, etc. Twenty-five pairs of the frames only weigh one ounce.

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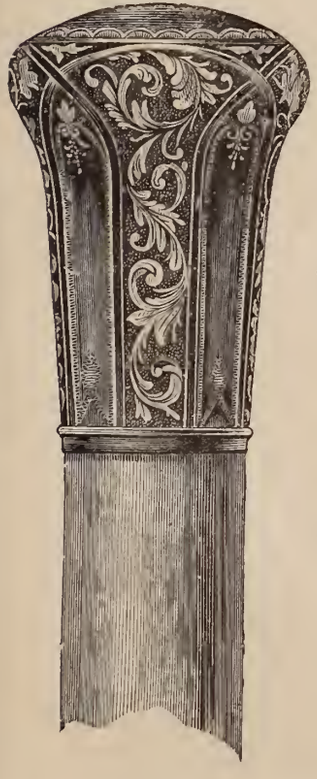
Watch Keys, Watch Case Springs, Watchmakers and Jewelers' Bench Tools.

CROSBY'S JEWELING TOOLS, &c.



☞ Sold by Jobbers in Watch Materials and Notions.

Small Articles in Metal manufactured to order.



J. F. FRADLEY,

MANUFACTURER OF

Fine Gold & Silver-Headed

Walking Canes,

AND

STERLING SILVERWARE,

OFFICE & FACTORY,

21 JOHN STREET,

NEW YORK

The Burbank Manufacturing Company

Manufacturers of GOLD & SILVER



Thimbles,



GOLD
SILVER,
STEEL,
RUBBER,
And SHELL,

EYE GLASS
Self Adjusting.

SPECTACLES AND EYE-GLASSES



OF ALL DESCRIPTIONS.

SOLID GOLD RINGS,

Office, 14 MAIDEN LANE, NEW YORK.

Manufactory, Springfield, Mass.

JNO. F. LUTHER.
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MANUFACTURER OF FINE
PRESENTATION JEWELS
FOR ALL SECRET SOCIETIES.
KNIGHT TEMPLAR'S CROSSES
KEY STONE MARKS
SOCIETY SCHOOL AND
COLLEGE BADGES.

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FOR SALE—J. Stark No. 3, American Lathe. with extra head and jewel setting attachment. J. M. Graham, 250 South Main St., Providence, R. I.

ANYONE desirlng to sell out a Jewelry Business that will bear investigation, can hear of a purchaser by addressing Thos. Hamer, Montgomery, N.Y. Eastern States preferred.

WANTED—A situation as a watchmaker and engraver, 7 years' experience, 4 years of city experience, good references. Address C. W. W., Box 252, Waverly, Tioga Co., N. Y.

JOSEPH HOEY & CO., No. 202 Broadway, New York, Photo-Wood Engravers,—each article engraved immediately from the photograph. The best and only reliable method. See page 12.

TO LET—A handsome show window on the ground floor of one of the most conspicuous stores on Maiden Lane situated between Broadway and Nassau street. Apply at the office of this Journal.

FOR SALE—A first clase jewelry store and stock, one of the best locations in the city. But little cash wanted. Sold on account of ill-health. Apyly at the office of the Jewelers' Circular.

FOR SALE—A well established retail jewelry business in a Western town. Address, H. B. Stolte, 24 South Pennsylvania street, Indianapolis, Indiana. Correspondenc invited of cash men who mean business.

WANTED—A situation, by a sober and industrious watchmaker and general repairer; can give good references, has good tools and knows how to use them. Address A., care W. L La Rue, Box 316, Wallingford, Ct.

PARTNER WANTED.—In a retail jewelry store of 15 years' standing. Capital needed four or five thousand dollars. One acquainted with the business preferred. Address Box 392. Washington. D. C. References exchanged.

WANTED—A good watchmaker, jeweler and engraver to go to Helena, Montana, to whom steady employment will be given. Unexceptionable references and security as to ability and character required Address Box Eleven. Jewelers' Circular.

FOR SALE.—The stock and fixtures of a first class jewelry store, in a flourishing manufacturing town of 10,000 inhabitants, doing a good business and first class customers. Poor health the reason for selling. For particulars address Jeweler, Box 1021, Ansonia Conn.

FOR SALE—an old established stand for Watchmaking and Jewelry business (Established in 1833). The proprietor having died, his widow will sell the Stock and fixtures, and rent the store and dwelling, if desired Apply to Hon. John Hitz, Swiss Consul Gen'l Washington, D.C.

A YOUNG WATCHMAKER with six years' experience desires a situation with some first class watchmaker, to finish the trade Understands engraving, repairing jewelry of all kinds, speaks German, is a good salesman, and is willing to work for low wages. Address That Watchmaker, Carrollton, Mo.

FOR SALE.—A book on "the Watch," 3d edition, Hand-work vs. Machinery, etc.; History of Watchmaking by Both Systems, by Henry F. Piaget, watchmaker. Price 2 cents. Post paid to any address on receipt of price, by the author, Henry F. Piaget, 36 Maiden Lane, N. Y., or at the office of this Journal.

FOR SALE—A jewelry and optical store in one of the most thriving manufacturing cities of New England, with 16 000 population. Only one competitor,—with good trade. Stock from $10,000 to $15,000. Best location in the city. Good reason for selling. Address H H. B., Box 93, New Haven, Ct.

TO WATCHMAKERS.—Wanted a situation by a first-class workman. used to fine watch repairing, good jeweler. 18 years' experience, several years in last situation; used to managing repairing brauch. Own tools. Undeniable references as to ability and character. Salary not so much an object as permanency. Address C. G. F., Jewelers' Circular.

Business Notices.

Albert Lorsch, manufacturer of the patent accomodating spectacles and eye glasses, announces a material reduction in the price of these goods. Lorsch spectacles are so well known to the trade by reason of their peculiar advantages to dealers who keep a limited stock that there is scarcely a jewcler or optician in this country who is not familiar with them. The interchangeable feature of these lenses is an advantage dealers appreciate as it enables them to keep a full assortment for a comparatively small outlay.

Buyer's Directory.

A Guide to the prominent Wholesale Houses in the Watch, Clock, Jewelry and kindred branches of Trade in New York, Philadelphia Chicago, and Providence.

New York.

Bohemian Garnet Jewelry.

Bissinger, Philip—Importer of Diamonds, Pearls and Precious Stones. Sole Agent for the Bohemian Garnet Jewelry in the United States and Canada. No. 22 John St., N. Y.

Clock Companies.

Seth Thomas Clock Co. Manufacturers of Clocks of all kinds. Salesroom, No. 581 Broadway,

Ansonia Clock Company.—Nos. 19 & 21 Cliff street, New York

Waterbury Clock Co.—M. Bailey, Treasurer, Manufs. and Jobbers, No. 4 Cortlandt Street, N. Y., and No. 197 State Street, Chicago.

Corals and Coral Jewelry.

Bishop, Victor & Co.—No. 47 Nassau street, Importers of Precious Stones, Cameos, &c. Also manufacturers of Coral Jewelry.

Errico Bros.—Importers of Coral, Conch-Shell and Silver Filigree Jewelry, etc., 19 John St.

Lawson, Samuel.—Manufacturer of Fine Gold & Coral Jewelry; Coral Jewelry altered, refinished and repaired, No. 63 Nassau St., N. Y.

Cameo Cutters, Etc.

Bonet, L—(Successor to Bernerd & Bonet), Cameo Likenesses, 599 Broadway, N. Y.

Haabermeier & Wiederer—Engravers of Cameo Likenesses, Seal Stones. Cameos repaired. 181 Broadway.

Zoellner, L.—Cameo Portraits. 835 Broadway. Specialty—Likenesses cut from Photos. and Life, Cameos repaired.

Charms & Gold Watch Keys.

Rupp & Held,—Manufacturing Jewelers, Charms and Gold Watch Keys, with French and English Ratchets, a specialty. 15 John st., N.Y.

Diamonds.

Anderson, Otis—Diamond Merchant. No. 9 Maiden Lane.

Bernhard, A & Co.—Manufacturing Jewelers & Importers of Diamonds and Precious Stones, also Diamond Mountings, No. 169 Broadway, Gilsey building.

Bissinger, E. & Co—Importer of Diamonds, 192 Broadway. New York.

Bissinger, Philip—Importer of Diamonds, Pearls and Precious Stones. Agent for the Bohemian Garnet Goods No 22 John St., N.Y.

Buckenham, Cole & Hall—Importers of Diamonds and other Precious Stones, No. 10 Maiden Lane, N. Y.

Fera, Henry—Importer of Diamonds, and Manufacturer of Fine Diamond Jewelry. No. 9 Maiden Lane, New York. Amsterdam, Holland, 23 Loojersgracht.

Herbert, R. J.—Importer and Broker in Diamonds, 2 Maiden lane, (office of Hall & Maxwell)

Morch, Jacob—Importer of Diamonds, Pearls, French & Italian Stone Cameos, Amethysts, Onyxes, and Precious Stones. Diamonds in pairs a specialty. No. 25 Maiden Lane, N. Y.

Neresheimer, E. Aug.—Importer of Fine Diamonds. No. 5 Maiden Lane, New York.

Diamond Cutters.

The Morse Diamond Cutting Co. of Boston.—Henry D. Morse, General Manager. N. Y. Office, 192 Broadway, corner John street. J. D. Yerrington, Agent.

Diamonds and Diamond Jewelry.

Bissinger, Philip.—Importer of Diamonds, 22 John street, N. Y. Agent for the Bohemian Garnet Goods.

Bornemann, Louis—Manufacturer of Diamond Jewelry from original designs, 169 and 171 Broadway.

Heller & Bardel—Manufacturers of Diamond Jewelry, and Dealers in Diamonds, No. 13 John street.

Marx, Kossuth & Co.,—Manufacturers of Diamond Jewelry, 39 Maiden Lane. Goods sent on selection.

Smith, Hedges & Co.—Importers of Diamonds Exclusively, and Manufacturers of Fine Diamond Jewelry, 1 Maiden Lane, cor. Broadway, N.Y.

Taylor & Brother—Importers of Diamonds and Diamond Jewelry, 676 Broadway.

Diamond Setters, Etc.

Asher, J.—Jeweler and Diamond Setter, Precious Stones Inlaid and Incrusted with Diamonds, Nos. 880 and 882 Broadway.

Friend, S.—Manufacturer of Fine Jewelry, and Diamond Setter. 33 John street, N. Y.

Dials, &c.

Caesar Brothers—Manufacturers of Enameled Clock Meter and Gauge Dials, Patent Door, Coffin and Pew Plates, Druggists' Labels, &c. No. 42 John Street, New York.

Gold, John T.—(Successor to the late T. Gold), Enamel Watch Dial Maker, 81 Nassau St.

Enamelers, Etc.

Nutt, J. D.—Enameler on Gold, Silver and Copper, 32 and 34 John St. Birds, Flowers, etc., Enameled in colors.

Orr, Jas. C.—Enameler on Fine Jewelry, Flowers, Birds, &c., Enameled in colors. Band Bracelets (a specialty). 77 Nassau Street.

Engravers and Die Sinkers

Fackner, Edward—Carver, Engraver and Chaser on Jewelry and Pencil Cases. Monograms Lettering, &c. 19 John Street.

Knapp, Charles—Engraver, Die Sinker & Manufacturer of Band Rings. 14 and 18 kt. Shanks and Heads for Rings, &c., 41 Maiden Lane.

Schuller, J. Dan'l—Stone Seal Engraver, Arms Crests, Initials and Monograms engraved on Stone Seals, &c. 71 Nassau street.

Electro Platers.

Jeandheur, F., & Son—Gold and Silver Electro Platers & Fire Gilders, Coloring Etruscan and Gold Jewelry specialty, 117 Fulton Street.

Fancy Goods, Clocks, Bronzes, Etc.

Hinrichs, C. F. A.—Importer and Dealer in French, English and German Fancy Goods, etc., etc. 29, 31 & 33 Park Place, N. Y.

Magnin, Ve J. Guedin & Co.—Importers of Clocks Bronzes, Musical Boxes & Rich Fancy Goods etc., 652 Broadway.

Le Boutillier & Co.—Importers of Fancy Goods, Clocks, Bronzes, &c. 3 Union Square.

Gold Chains, Etc.

Beck, J. & Son, Manufacturers of Fine Gold Chains and Chain Bracelets, 10 Liberty place, near Maiden lane, N. Y.

Dorrance, Edge & Co.—Manufacturers of the Celebrated Woven Fabric Gold Chain, No. 9 John street.

Hamiltons & Hunt.—Manufacturers of Fine Plated Chains and Patent Buckle Bracelets. Branch office, 176 Broadway. Factory, 226 Eddy street, Providence.

Nordt & Schlag.—Manufacturers of Chains and Fine Jewelry. No. 379 Broome street, N. Y.

Kaufmann Bros.—Manufacturers of Gold Chains, and Chain Bracelets, 26 John street; Factory, 331 and 333 Bowery, N. Y.

Saxton, Smith & Co.—Manufacturers of Fine Gold Chain. 194 Broadway.

Gold Pens, Etc.

Aikin, Lambert & Co.—Manufacturers of Choice Gold Pens, Cases, Holders, Toothpicks, etc., 12 Maiden Lane, N. Y.

Mabie, Todd & Bard—Manufacturers of Gold Pens, 180 Broadway.

Todd, Edward & Co.—Manufacturers of Gold Pens, Pencil Cases, Tooth Picks, &c., 652 Broadway, N. Y. Factory, Brooklyn.

Goldsmiths, &c.

Greene, Wm. C. & Co.—Goldsmiths; Manufacturers of Rich Sets in Taper Wire Coral. Office, 18 John street.

Gold Rings.

Bowden, Joseph B.—Manufacturing Jeweler.—Solid Gold Rings a specialty, 11 Maiden Lane.

Ely, W. H.—Manufacturer of Solid Gold Rings of every description. No. 58 Nassau Street.

Hair Jewelry.

Bernhard, A. & Co.,—Manufacturers of Fine Hair Jewelry and Device Work. The latest styles 169 Broadway, Room 3, New York.

Menge, Chas. T.—Manufacturer of Fine Hair Jewelry and Device Work. No. 32 John St.

Schwencke O.—Manufacturer of Fine Hair Jewelry. Orders from the country promptly attended to. No. 43 Maiden Lane.

Jewelry Cases, Fancy Boxes, Etc

Braun, Chr. E.—Manufacturer of Jewelry Boxes, Trays for Show Cases, &c., 62 Chatham stt.

Dahlem, W.—Manufacturer of Cases for Jewelry and Silverware, No. 85 Nassau Street, N. Y Show Case Trays, &c., at the shortest notice

Wiggers & Froelick—No. 60 Nassau street.—Manufacturers of Cases for Jewelry, &c., of every description. Trays for Show-cases, Stands for Show-windows, etc. Jewelers' Traveling Cases, light, convenient and strong.

Jackson, Samuel C.—Manufacturer of Boxes and Trays, for Silverware, Watches, Jewelr &c. 180 Broadway, N. Y.

Lauten, E. A.—Manufacturer of Boxes for watchers, Silverware Manufacturers, &c. No. 63 Prince Street, N. Y.

Sturn, I.—Manufacturer and Importer of Cases for Jewelry, Watches, Silverware, &c. No. 15 John street, N. Y.

N. Y. Fancy Leather Works, Manufacturers of Jewelry Cases, in Russia, Morocco, Velvet, Satin, Rosewood & Blackwalnut; Silverware Cases of every description. Geo. W. Spitzer, 33 Maiden Lane, N. Y.

Welch & Miller—Manufacturers of Morocco, Velvet, and Satin Jewelry Cases, Trays, &c. Complete stock on hand. 169 Broadway.

Jewelry—Fine.

Aikin, Lambert & Co.—Manufacturers. General stock of Reliable Jewelry, 12 Maiden Lane.

Alford, C. G. & Co., Manufacturers. General line fine and reliable goods. Specialties in Onyx goods and chain. 183 Broadway, New York.

Andrews, J. F—Manufacturer of Fine Jewelry, Lockets, Sleeve Buttons and Rings in Stone Cameo, etc., a specialty. 35 Maiden Lane.

Baldwin, Sexton & Peterson,—Manufacturers Fine Jewelry. Whiting Building, Broadway and Fourth street.

Ball, W. H.—Manufacturing Jeweler. Fine Gold Bracelets a Specialty. No. 9 John St., N. Y.

Barthman & Straat—Manufacturers of Fine Jewelry. Seal and Stone Rings a Specialty Orders promptly attended to. 41 Maiden L

Bissinger, E. & Co.—Importers Fine Jewelry, Lockets, Crosses, Neck Chains, &c., No. 192 Broadway.

Brown, Thos. G.—Manufacturer of Rich Jewelry Necklaces, Lockets, Bracelets, Sleeve Buttons, etc., 9 Bond street, N. Y.

Brainerd, Steele & Co.—Manufacturers of Fine Jewelry and Brainard's Patent Lockets. No. 9 Maiden Lane, New York.

Burch, DeMott & Coughlin.—Manufacturing Jewelers, 17 Maiden Lane, N. Y.

Carrow, Crothers & Co.—Manufacturers of Fine Jewelry, Roman Band Bracelets, Lockets, Crosses, &c. 12 John Street, N. Y.

Carter, Howkins & Sloan.—Manufacturing Jewelers, Whiting Building, 4th St. & Broadway

Colby & Johnson.—Manufacturers of Fine Jewelry, and Importers of Watches. No. 17 Maiden Lane.

Chatellier & Spence,—Manufacturing Jewelers. No. 652 Broadway, N. Y.

Coe, Pinneo & Stevens—Manufacturers of Fine Jewelry, Lockets a specialty. Office, old No. 9 Maiden Lane N. Y.

Chatterton & Dodd—Successors to Fitch & Chatterton, Manufacturers of Fine Gold Jewelry, Chains, Band and Chain Bracelets, No. 19 John street, N. Y.

Demmert Bros. & Co.—Manufact'rs & Importers of Fine Jewelry, Cameo and Onyx Lockets, Sleeve Buttons and Sets a specialty. Old No. 9 Maiden Lane, New York.

Earle, M. A.,—Manufacturing Jeweler, Pearls, Cameos, and Diamond Mountings. No. 25 JohnStreet. Ralph D. Earle, Agt.

Field & Co.—Manufacturiug Jewelers, 8 Maiden Lane, N. Y.

Fitch, D. M. & Co.——Manufacturers of Fine Jewelry. Diamond and pearl mountings a specialty. No. 15 John street.

Frankel & Folkart,—Manufacturers of Seal, Cameo and Amethyst Rings, Ladies' and Gents' Lockets, Cameo Sets, &c. Also a full line of Diamond Settings, 192 Broadway, cor. John street, N. Y.

Geoffroy, A. R—Manufacturing Jeweler, 4 Courtland street, N. Y. Manufacturer of Geoffroy Patent Stone Lined Sleeve Buttons, Studs and Collar Buttons.

Goddard, John M.—Manufacturing Jeweler,—Seal Rings and Fine Lockets a specialty, No. 25 Maiden Lane, N. Y.

Greason, Bogart & Pierce, successors to Arthur, Rumrill & Co., 182 Broadway, manufacturers of fine jewelry and gold chains

Howard, H. & Co.—Manufacturing Jewelers. No. 14 John St., N. Y.

Hedges, A. J. & Co.—Manufacturing Jewelers, 9 Maiden Lane.

Hartmann, P.—Manufacturer & Importer of Fine Gold, Diamond, and Filagree Silver Jewelry, No 36 Maiden Lane. P. O. Box 2,454.

Haskell, H. C.—Manufacturing Jeweler. Seal Rings a specialty. Special attention to Jobbing of every description. 12 John street.

Hunt & Owen.—Manufacturing Jewelers. Office, 5 Maiden Lane.

Hale & Mulford,—Manufacturers Rich Jewelry, Whiting Building, Broadway and 4th Street.

Jeanne Brothers.- Manufacturers of Diamond Mountings & Rich Jewelry. 1 Maiden Lane.

Kipper, Vogel & Co.—Manufacturers of Fine Jewelry. Etruscan Goods a specialty. No. 17 Maiden Lane.

Keller, Chas. & Co.—Manufacturing Jewelers Lockets a Specialty. No. 13 John St., N.Y.

Kuhn & Doerflinger—Manufacturers of Enamel'd and Roman Band Bracelets, also Fine Lockets and Pendants, 18John street.

Lennon, John D.—Manufacturing Jeweler, 142 Fulton street. Flat, and Half-round Gold Bracelets, Roman and Stone Lockets.

Moore & Horton.—11 Maiden Lane, Manufacturing Jewelers, Rings, Studs, Collar and Sleeve Buttons, Pins, Ear-riugs, &c.

Mitchell, Noah—Manufacturer of Fine Gold Jewelry, 694 and 696 Broadway, N. Y.

Miller Bros.—Manufacturers of Fiue Jewelry Lockets, Sleeve Buttons, Studs, etc., etc. 11 Maiden Lane, New York.

Mulford & Bonnet—Manufacturing Jewelers and Jobbers, 21 & 23 Maiden Lane, N. Y. Particular attention given to Jobbing and Special orders

Maass, Cook & Groeschel—Manufacturers of Fine Jewelry and Lockets, 191 Broadway, (over Mercantile Bank,) N. Y.

Marx Kossuth & Co.—Manufacturing Jewelers. 39 Maiden Lane.

Owen, G. & S. & Co.—Manufacturing Jewelers. Office, No. 5 Maiden Lane.

Post & Speir, successors to Post, Beach & Decker Manufacturers of Fine Jewelry, Band Bracelets a specialty. 192 Broadway.

Riker, William—Manufacturer of Jewelry. Inlaid Gold Jewelry a Specialty. No. 5 Maiden Lane, N. Y.

Riley, J. A. & Co.—Manufacturing Jewelers, Etruscan Gold and Coral Sets, Roman Bracelets, Necklaces, etc. Onyx Goods a specialty. 7 and 9 Bond street, New York.

Richardson, J. W. & Co.—Manufacturers of Jewelry, Masonic and other emblems. 196 Broadway, Manufactory, Providence, R.I.

Sexton & Cole—Manufacturing Jewelers, Colored Gold and Onyx Goods a specialty. No. 61 Nassau street, N. Y

Shoemaker & Co.—Manufacturing Jewelers, Cameo Buttons, and Lockets, Roman Gold Goods, etc. No. 21 Maiden Lane, N. Y.

Stites E.—(Late E. & D. H. Stites, and Saffen & Stites), Manufact'ring Jeweler, 12 Maiden Lane.

Sturdy Bros. & Co.—Manufacturers of Jewelry, No. 14 Maiden Lane, New York.

Spiess & Rosswog—Manufacturers of Fine Jewelry and Diamond Goods, Nos. 9 and 11 Maiden Lane, N. Y.

Thoma, Ernest—Manufacturer of Fine Jewelry. Sleeve Buttons, Rings, Ear-rings, &c. No. 173 Broadway, N. Y. Factory, Hackensack, N. J.

Vulcanite Jewelry Co.—Manufacturers of Whitby Jet and Vulcanite Jewelry, 191 Broadway, N. Y.

Wadsworth, E. E.,—Manufacturer of Rich Jewelry and fine Rolled Plate. Fine Seal Rings a specialty. 35 Maiden Lane.

Wilson & Brown—Successors to Dellerc & Co. Manufacturers of Fine Jewelry, Enameled Goods a specialty. 113 Fulton street, opposite Dutch street.

Woglom & Miller—Manufacturing Jewelers, Nos. 32 & 34 John street, N. Y. Specialty, Black Onyx goods.

Jewelry—Rolled Plate, Celluloid, &c.

Celluloid Novelty Co.—Manufacturers of Imitation Coral Jewelry, 4 Maiden Lane.

Jewelry Glasses.

Brown, Edwin—Lapidary. Manufacturer of Glasses, for all kinds of Jewelry, Clocks, Chronometers, &c. Glasses bent to any shape. No. 85 Nassau st.

Jewelers' Boxes.

Swift Manufacturing Co.,—Manufacturers of Jewelers Wood Nested and Mailing Boxes. No. 16 Cortlandt St

Dennison & Co.—Manufacturers of Jewelers Findings, Paper Boxes, Cards, Tags, Cottons Tissue Papers, &c., 198 Broadway, N. Y.

Frasse & Co.—Importers of Stubs, French, Swiss, German and Sheffield Tools, Files and Steel Wire for Watchmakers, Jewelers, etc., 62 Chatham street, N. Y.

Hammel, L. & Co.—Importers of Materials and Tools for Watchmakers, Jewelers and Engravers—also Optical Goods, &c., 9 Maiden Lane, N. Y.

Sudendorf, E.,—Importer of Superior Jewelers and Bracket Saws, quality warranted. Orders by mail promptly filled. No. 86 Nassau st.

Zimmern, Henry—Importer of Watch Materials, Tools, Glasses, Silk Guards, Silver & Plated Chains, Optical & Fancy Goods, 8 Maiden L

Lapidaries.

Kordmann & Michel—Lapidaries, dealers in Precious Stones. Rubies, Sapphires and Peridots cut. No. 53 Nassau St., N. Y.

Musical Boxes.

Paillard, M. J. & Co—Importers & Manufacturers of Musical Boxes, No. 680 Broadway, N. Y.

Opticians.

Burbank Manf'g Co.—Manufacturers of Spectacles and Eye Glasses of all descriptions, in gold, silver, etc., 14 Maiden Lane, N. Y.

Du Bois, Geo. W.—Successor to A. Landsberg, Importer and Manufacturer of Optical Goods 36 Maiden Lane. Box 3993, N. Y.

Hammel, L. & Co.—Importers of Spectacles, Opera and Marine Glasses, Telescopes, Microscopes, Optical & Fancy Goods, 9 Maiden L.

Laurencott, J. B.—Importer of Watch Glasses, Optical and Fancy Goods, Clocks, Bronzes, etc., 33 Maiden Lane, N. Y.

Lorsch, Albert—Manufacturer of the Patent Accommodating Spectacles and Eye Glasses in Gold, Silver and Steel, and other Optical Goods, 37 Maiden Lane, N. Y.

Spencer Optical Manufacturing Co.—Gold, Silver, Steel and Nickel Plated Spectacles, Eye Glasses, &c. 13 Maiden Lane, N. Y.

Sussfeld, Lorsch & Co.—Optical and Mathematical Instruments, Watchmakers' Tools, Materials, &c. 13 Maiden Lane, N. Y.

Suttie, Wm. J.—Manufacturer of Eye Glasses and Spectacles, in gold, silver, steel and shell, (Price List by mail), 39 Maiden Lane.

Precious Stones, &c.

Bissinger, Philip—Importer of Diamonds, Pearls and Precious Stones. Agent for the Bohemian Garnet Goods. No. 22 John St., N. Y.

Gruet, Jules.—Importer of Precious and Imitation Stones, Amethysts, Topazes, Cameos, Garnets, Doublets, Imitation Diamonds, Pastes, etc., No. 14 John street. Manufactory at Septmoncel, France.

Meyer, Francis Ed.—Successors to John B. Behrmann, Importer of Imitation Precious Stones, all sizes and shapes constantly on hand. No 38 Dey street, P.O. Box, 1981.

Rings and Shanks.

Bryant & Bentley.. Manufacturing Jewelers, 350 Patterns Hard Solder Rings, 12 Maiden Lane

Knapp, C.—Manufacturer of Band Rings of 14 and 18karat, Gold Shanks & Heads for Rings. 41 Maiden Lane.

Silverware.

Gorham Manufacturing Co.—Union Square.

Whiting Manufacturing Co.—Manufacturers os Sterling Silverware, cor. Broadway & 4th st.

Wood & Hughes.—Manufacturers of Fine Silver ware. 14 John Street, N. Y.

The Adams & Shaw Co.—Manufacturers of Silverware. Cor. Broadway & 4th St., N. Y.

Silver Plated Ware.

Hall, Elton & Co.,—Manufacturers of the Finest Electro-Plated Ware, salesroom, 75 Chambers street, N. Y.

Holmes, Booth & Haydens—Manufacturers of Silver-plated Ware. 47 Chambers street.

The Adams & Shaw Co.,—Silversmiths, Whiting Building, cor. Broadway & 4th street, N. Y.

Meriden Britannia Co—Manufacturers of Silver plated Ware, 550 Broadway, N. Y.

Middletown Plate Co.—Manufacturers of Superior Electro-Plate. Factories, Middetown, Conn., Salesroom, 13 John Street

Manhattan Silver Plate Company.—Manufacturhrs of every description and quality of Silver Plated and Bronze Ware, office No. 39 John treet. Factory 382 to 390 2d Ave.

Rogers & Bro.—Manufacturers of the finest quality of Electro-Plated Ware. 690 Broadway.

Reed & Barton—Manufacturers of Fine Plated and Table Ware, of every description, 686 Broadway, N. Y.

Simpson, Hall, Miller & Co.—Manufacturers of Fine Silver Plated Ware, No. 676 Broadway,

Webster, E. G. & Bro.—Manufacturers of Fine Silver Plated Ware. Office and Warerooms, 14 Maiden Lane, N. Y.

Show Cases, Etc.

Kelly, P. J.—Manufacturer of all kinds of Show Cases, Counters and Refrigerators, No. 50 New Bowery, N. Y.

Kraft & Hoffmeister—Manufacturers of Metal Show Cases, Jewelry Trays always on hand, 8 & 13 North William street, N. Y.

Spectacle Case Manufacturers.

Koenen, A. & Bro. Manufacturers of Leather Spectacle & Eye Glass Cases, 81 Nassau St., N. Y

Thermometers Etc.

Tagliabue, Giuseppe—Thermometer, Barometer and Hydrometer Manufacturer, 302 Pearl street near Beekman, N. Y

Thimble Manufacturers.

Burbank Manuf'g Co.—Manufacturers of Gold & Silver Thimbles, 14 Maiden Lane, N: Y.

Ketcham & McDougall--Improved Gold and Silver Thimbles, Nos. 4 and 6 Liberty Place, near Maiden Lane, N. Y.

Walking Canes.

Fradley, J. F.—Manufacturer of Fine Gold and Silver-headed Walking Canes and Sterling Silverware. Office and Factory, No. 21 John street, N. Y.

Watch Companies.

American Watch Co.—Robbins & Appleton, No. 9 Bond street, N. Y.

Hampden Watch Co.—of Springfield, Mass. Office, No. 12 John St., New York.

Springfield Watch Co.—Factory, Springfield, Ill. Office. 11 Maiden Lane.

Tiffany & Co.—Makers of Fine and Complicated Watches. Office 14 John street, N. Y.

Watch and Chronometer Jeweler.

Queen, James—Watch and Chronometer Jeweler and Pallet Maker, 78 Nassau street, Room 8. Pivots inserted in Pinions, Balance, Staffs, &c.

Watch Importers, Etc.

Aikin, Lambert & Co.—Importers of Watches, Sole Agents for Paul Breton & Chas Latour, Geneva. A general line of reliable Swiss Watches. Watch Cases of all styles made to order. 12 Maiden Lane, N. Y.

Bartens & Rice—Importers of Watches, Watch and Chrometer Makers. No 3 John street.

Beguelin, Tell A.—Importer of Watches, Watch Materials, Tools, etc. No. 71 Nassau St.

Bodine, G. M.—Importer and Dealer in Watches and Jewelery, etc., also Agent for Bird & Bros.', Gold Pens & Pencils, 22 Maiden Lane.

Bourquin Brothers—Importers of Watches from their own manufactory at Bienne, Switzerland, 20 Maiden Lane, N. Y.

Bynner, T. B.—Importer and Jobber of Watches, Diamonds and Fancy Goods, and dealer in the best class of Rolled Plate Jewelry. 513 Broadway.

Gagnebin, Chas.—Importer of all kinds of Watches, 64 Nassau Street. Agent for Ulysse Breting's Fine Chronometers, Chronographs, Anchors, etc.

Cross & Beguelin—Importers of Watches, Watch Tools and Materials, dealers in American Watches, No. 21 Maiden Lane, N. Y.

Deraismes Brothers—(Successors to L. A. Lutz and Lutz Bros.) Manufacturers and Importers of Watches. Fine movements a specialty. 182 Broadway, N Y Factory in Locle.

DuBois, Francis & Co.—36 Maiden Lane, N. Y., Importers of Watches and Manufacturers of Watch Cases.

Droz, Henry E.—Importer of Watches and Watch Case manufacturer. Agent for the "E. Perregaux" Watch, and jobber in American Watches, No. 92 Fulton Street, N. Y.

Freund, Goldsmith & Co.—Importers of Watches Jewelry and Precious Stones, 8 Maiden Lane

Ginnel, Henry—Importer of Watches, Tools and Materials. No. 31 Maiden Lane, N. Y. P. O. Box 2967

Harrison, Henry.—Watches and Jewelry. No. 66 Nassau St. Established 1848.

Hyde's Sons, John E.—Wholesale Commission Agents only, for Juks Jurgensen, of Copenhagen. Ed. Perreganx, Locle, Monard Freres, Geneva, Watches, and of other makers of every quality. No. 22 Maiden Lane.

Keller, L. H. & Co.—(Successors to G. A. Huguenin,) Importers of Fine Watch and French Clock Materials, No. 64 Nassau street, N. Y.

Kahn, L. & M.—Importers of Watches, No. 10 Maiden Lane, New York.

Mathez, F. H.—Importer of Watches. No. 5 Maiden Lane, N. Y.

Magnin, Ve J. Guedin & Co.—Importers and Agents of the Nardin Watch, No. 652 Broadway, N. Y.

Mathey, L. & A.—Importers of Fine Watches and Sole Agents for the **H. L. Matile's** Watches, No. 119 Fulton Street, N. Y.

May & Stern—Importers of Foreign Watches, Materials and Tools, etc. Manufacturing Jewelers. No. 20 John St., N. Y.

Nicoud & Howard,—Importers and Manufacturers of Watches, No. 14 John street, N. Y.

Oppenheimer Bros. & Veith, Dealers in Watches and Diamonds, and Manufacturing Jewelers. No. 35 Maiden Lane, N. Y.

Quinche & Krugler.—Agents for the Borel & Courvoisier Nickel Movements, 17 Maiden Lane, N. Y.

Robert, J. Eugene—No. 9 Bond street, New York Agent for Louis Audemar's celebrated watches.

Schwob, Adolphe—Manufacturer & Importer of Watches, 11 Maiden Lane, N. Y.

Saltzman & Co.—Manufacturers and Importers of Fine Swiss Watches, 15 Maiden Lane, (up stairs,) N. Y. Factory, Chau de-Fonds, Switzerland.

Stein & Brother—Importers and Jobbers of Swiss and American Watches, Chains, Jewelry, &c. 767 Broadway.

Stern Brothers & Co.—Importers of Swiss Watches and wholesale dealers in American Watches, &c., No. 33 John Street, N. Y.

Scott, J. T. & Co.—Importers of Watches, and Manufacturers of Jewelry, and Jobbers of all grades American Watches. No. 11 Maiden Lane, N. Y.

Tiffany & Co.—Makers of Watches. General Agents for Patek, Phillippe & Co. Wholesale office, 14 John street, N. Y.

Waaser, F.—Importer of Watches, Materials, Tools, &c., Sole Agent for Ducommun's Main Springs, 52 Nassau street, N. Y.

Watch Cases.

Brown, J. A. & Co.—Manufacturers of The Ladd Patent Stiffened Gold Watch Cases, &c., 11 Maiden Lane, N. Y. Factory, 58 Eddy street, Providence, R. I.

Laurent, J.—Watch Case Manufacturer, Gold and Silver American Watch Cases constantly on hand. 17 John street, N. Y.

Watch and Chronometer Repairer.

Cerf, B.—Practical Watchmaker and Repairer, No. 10 John street, N. Y. Repairing and adjusting of Fine Watches done for the trade. All kinds of escape and stem winding wheels cut to order.

Ludeman, W. H.—Chronometer and Watchmaker. Repairing of every description for the Trade. 75 and 77 Nassau street, N. Y

Sirois, A.—Practical Watchmaker, 75 and 77 Nassau street (Room 18), N.Y. Special attention paid to the repairing of Fine Watches. Pivots inserted.

Watch Case Repairers.

Tarbox, Hiram—Watch Case Repairing, Springing, Polishing and Engine Turning, 79 Nassau street, (room 22), N. Y.

Renaud, F.—Watch-Case Repairer.—Solid and Heavy Rolled Plate Bows and Pendents. Springer and Engine Turner of Cases and Jewelry, 36 Maiden Lane

Watch Guards.

American Silk Guard Manufacturing Co.,—Our goods are warranted all silk.—Kossuth Marx & Co. No. 39 Maiden Lane, N. Y.

Watch Glasses, Shades, Etc.

Berger, Albert, & Co.—Importer of Watch Glasses, Spectacles, Opera Glasses, Telescopes, &c., &c., No. 47 Maiden Lane, N. Y.

Hill, Robert S.—Manufacturer of Watch Glasses, &c, dealer in Imported Glasses, Flat Glasses a specialty; also, Jeweler's Glasses. Nos. 75 & 77 Nassau street, N. Y.

CINCINNATI.

Oskamp, Clemens.—Manufacturing Jeweler and Silversmith, Importer and Wholesale Dealer in Watches, Clocks, Materials, &c., 175 Vine street, Cincinnati, Ohio.

PHILADELPHIA

Booz & Thomas.—Manufacturers of Gold and Silver Watch Cases and Jewelry, 108 South 8th Street, Philadelphia.

Bennett, Jacob & Son,—Diamond Setters and Manufacturing Jewelers. 108 South 8th St., Philadelphia, Pa.

Conover David F. & Co.—American Watches, Wholesale Salesroom, southeast corner 7th and Chestnut streets, Philadelphia.

Hagsoz & Thorpe.—Manufacturers of Boss' Patent Stiffened Gold Watch Cases. Ledger Building. N. Y. Office, 13 John street.

Herold, Chas P.—Successor to Hildebrandt, Herold & Co., Manufacturing Jeweler and Diamond Setter. Diamonds. 916 Chestnut St.

H. Muhr's Sons.—Manufacturing Jewelers. Solid Gold Rings a specialty, 158 North Second st.

Rolb, G. F. & Son.—Manufacturer of fine Morocco, velvet and Cabinet Cases for jewelry watches and Silverware. 722 Sansom street.

Krider, Peter L.—Manufacturer of Sterling Silver Ware, Artisan Hall, No. 618 Chestnut street

Liechty, D. & Co.—Manufacturers of gold and silver watch cases, and importers and dealers in Swiss and American watches, 402 Library street, Philadelphia.

Morgan & Headly.—Manufacturing Jewelers Cameo sets, Gold sets, Roman Lockets, Rings, Coral sets, and a general line of rich goods. 611 and 613 Sansom street, Philadelphia.

Pequignot, C. & A.—Manufacturers of Watch Cases, and dealers in American and Imported Watches. 22 S. Fifth street, Philadelphia.

Scherr, L. A. & Co. Wholesale Dealer in Watches Silver Plated Ware, Spectacles, Fancy Goods, Watch Materials, etc., 726 Chestnut street.

Spiecker, Simons & Bro.—Manufacturers of Fine Jewelry. Roman work a specialty. 138 South Second Street, Philadelphia

Simons, Brother & Co.—Manufacturers of Gold and Silver Headed Canes and Gold and Silver Thimbles. 611 & 613 Sansom St., Phila.

The Philadelphia Watch Co.—No. 618 Chestnut Street, Philadelphia. New York Agency, L. H. KELLER & Co., 64 Nassau St.

CHICAGO.

American Watch Company, of Waltham, Mass. No. 170 State street, Chicago.

Charpier & Wachier.—Watchmakers and jewelers for the trade, and dealers in all kinds of watch materials. 61 West Kinzie street.

Dexter, W. W.—Watchmaker for the Trade Repairer of Fine Watches, Chronometers French Clocks, Music Boxes, &c. Room 32, Tribune Building, Chicago.

Purdy, J. H. & Co.—Jobbers of large and small Tools and Materials, for the use of Watchmakers, Jewelers, and kindred Trades. Spectacles—Jewelry Boxes, Plated Chains, &c., &c. No. 170 State street.

PROVIDENCE

Cooke, Daniel S. & Co.—Manufacturers of Solid Gold Initial Sleeve Buttons, Lockets, Cuff Pins, Rings, &c. 102 Orange Street.

Irons, Chas. F.—Manufacturer of Solid Gold Jewelry. Specialty Emblems, Pins and Charms Masonic, Odd Fellows, &c. 102 Friendship St.

Perkins, C. H.—Successor to Davis, Platt & Co., Manufacturer of Fine Gold Jewelry. Specialty, Ladies' Setts, Brooches and Earrings. No. 20 Conduit St., Providence, R. I.

Potter, Charles L.—Manufacturer of Pearl Shell Goods, Patent Spiral Studs a specialty, 407 Pine street, Providence, R. I.

NEWARK.

Condit, Hanson & Van Winkle.—Manufacturers of Machines for Electro-plating, &c.

Jones, F.—Gold and Silver Refiners, Assayers and Sweep Smelters Maple Place, Green street, Newark, N. J.

Lefort, Henry.—Stem-winding Watch Crown Manufacturers. 80 & 82 Marshall St.

Lelong, L. & Bro.—Gold and Silver Refiners, Assayers and Sweep Smelters, S. W. corner Halsey & Marshall streets, Newark, N. J.

Milne & Jourdan—Manufacturers of Stem-winding Watch Crowns Nos. 13 & 15 Franklin Ave., Newark, N. J.

Prince, David—Gold and Silver Refiner, Assayer and Sweep Smelter. Sole Agent for Comin's Improved Amalgamator. 63 Railroad Ave.

Van Houten, Sayre & Co.—Manufacturing Jewelers, 45 Franklin street, Newark, N. J.

L. HAMMEL. LOUIS RUNKEL.

L. HAMMEL & CO.,

Importers of Watch Materials, Tools.

Watch Glasses, Silk Guards, Spectacles, Opera Glasses, Optical Goods, &c.

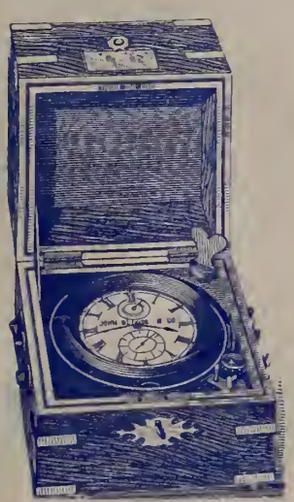
☞Sole Agents in the United States for **G. B. Wheeler's Star Watch and Clock Oil,** and the Celebrated **Gravier Mainspring.**

☞ We would respectfully call the attention of the Trade to the celebrated **Star Spectacles and Eye Glasses,** of which we are the Sole Importers.

We would call the especial attention of the Trade to the celebrated PANTASCOPIC STAR SPECTACLES. they are the best made goods in this market! The frames of these Spectacles are light, finely tempered and highly finished, while the lenses are remarkable for their clearness, purity, and freedom from specks and flaws.

L. HAMMEL & CO., No. 9 Maiden Lane, New York.

☞Send for Price List.



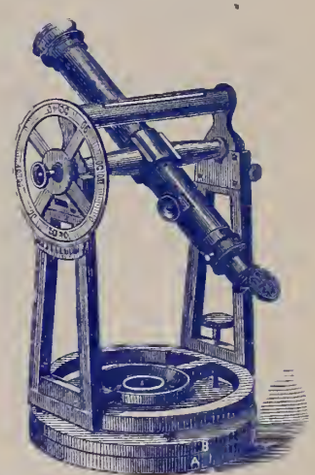
Standard Marine Chronometer
FOR KEEPING CORRECT TIME.

JOHN BLISS & CO.

STANDARD MARINE

Chronometers and Transits,

FOR WATCHMAKERS' USE.



No. 10

110 WALL STREET, NEW YORK.

IMPORTANT NOTICE.—These Transits are readily set in position without the aid of strictly correct time as a basis for that purpose. Printed instructions, easily understood, accompany each Instrument, and no calculations are required preliminary to setting in position.

As a trial only is required to insure unqualified approval, we are induced to make the following **LIBERAL OFFER**—On receipt by us of satisfactory reference, and 10 per cent. of the price, we will send one of the foregoing Transit Instruments, on hire or trial, for one month, with full printed instructions for setting up and using the same, and if purchased after trial, we will allow the whole hire to apply in part payment, and sell the Instrument on approved note at four months for the balance. Special terms for payment by installments, after trial, on application. We do not make this offer merely to hire these instruments, but to insure a trial with a view to sales, the hire received being only sufficient to cover the cost of repolishing in case they are returned. Send for Illustrated Circular giving full description.

JOHN BLISS & CO., 110 Wall Street, New York

E. Aug. Neresheimer,

IMPORTER OF DIAMONDS,

—AND—

Manufacturer of Fine DIAMOND JEWELRY,

No. 5 Maiden Lane,

NEW YORK.



HENRY MAY. Established 1854. JOSEPH STERN.

MAY & STERN,

IMPORTERS OF

Foreign Watches, Materials and Tools

AGENTS FOR THE SALE OF ALL

DOMESTIC MOVEMENTS AND CASES,

And MANUFACTURING JEWELERS

No. 20 John Street, New York.

☞ SOLID GOLD SEAL RINGS, in Cameo, Amethyst, Topaz and Onyx, A SPECIALTY.

L. LELONG & BROTHER,

GOLD & SILVER REFINERS,

Assayers and Sweep Smelters,

S. W. Cor. Halsey & Marshall Streets,

NEWARK, N. J.

SWEEPINGS A SPECIALTY.

CHAS. KELLER & CO.,

No. 18 John Street, New York.



Patented March 28th, 1876.

MANUFACTURE the above PATENTED LOCKET,

In plain gold, and with fine onyx and cameo fronts, to hold 2, 4 and 6 pictures.

☞ FOR SALE BY THE BETTER CLASS OF JOBBERS. ☜

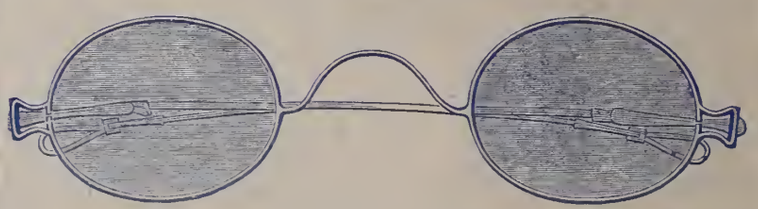
ALBERT LORSCH,

MANUFACTURER OF

PATENT ACCOMMODATING

Spectacles and Eye Glasses,

In Gold, Silver, Steel, &c.



Also Latest Novelties in Fine WATCHES & JEWELRY.

PRICES REDUCED TO SPECIE BASIS.

☞ I would call especial attention that with the above Spectacles and Eye Glasses it is only necessary to have one complete assortment of the different kinds of lenses, which being of uniform size, will interchange in all the different kinds of frames, thus giving a complete assortment for a comparatively small outlay

ALBERT LORSCH, 37 Maiden Lane, New York.

LORSCH BROS., 120 Sutter St., San Francisco, Cal.

L. & M. KAHN,

Importers of

Sole Agents for
James Kahn.
E. Bourquin & Fils,
AND
Alphonse Matile
WATCHES.

WATCHES.

No. 112 Kearny Street,
San Francisco,
CAL.

No. 5 Rue des Alpes,
Geneva,
SWITZERLAND.

No. 10 Maiden Lane, New York.

Manufacturers of the EAGLE TIMER! *the Best in the market.*

Volume IX. No. 2.

MARCH, 1878.



JEWELERS CIRCULAR.

D. HOPKINSON, PUBLISHER.

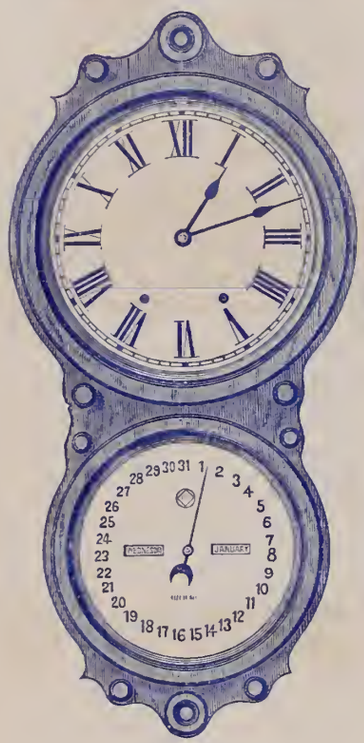
42 NASSAU STREET, NEW YORK.

American Clock Co.

581 BROADWAY, NEW YORK.

No. 172 State Street, Chicago. No. 7 Montgomery St., San Francisco.

Office Calendar.



No. 6.

SOLE AGENTS IN AMERICA FOR

E. N. Welch M'f'g Co. **New Haven Clock Co.**

Seth Thomas Clock Co. **Welch, Spring & Co.**

Seth Thomas' Sons & Co.

A. S. Hotchkiss' Tower Clocks,

(Made by the Seth Thomas Clock Co.)

A NEW

Seth Thomas Calendar Clock.

Eight-day Spring Time; Eight-day Spring Strike.

12 Inch Time Dial. **10 Inch Calendar Dial.** **Hight, 32 Inches.**

TO THE TRADE.

Gentlemen: Our Illustrated Catalogue for 1878, of Seth Thomas, New Haven, E. N. Welch, and Welch, Spring & Co. Clocks will be ready about March 20th.

We shall mail a copy to each of our customers, and if any of them fail to receive it by April 1st, they will please ask us for it.

Copies will be furnished the Trade upon application. Very truly,

AMERICAN CLOCK COMPANY,

HINE & THOMAS.

F. KROEBER,

No. 8 CORTLANDT STREET, NEW YORK.

MANUFACTURER AND DEALER IN EVERY DESCRIPTION OF

AMERICAN CLOCKS.

WALNUT CLOCKS OF A SUPERIOR GRADE A SPECIALTY.



"BATAVIA."—Walnut.
8-Day Strike; Height, 20 inches.
List Price, $12.00.



"ONWARD."—Walnut.
1-Day Strike; Height, 14 inches.
List Price, $4.50.



"RESCUE."—Walnut.
1-Day Strike; Height, 15 inches.
List Price, $4.50.



"OTTAWA."—Walnut.
8-Day Strike; Height, 22 inches.
List Price, $11 00.

ESTABLISHED 1857.

Waterbury Clock Comp'y

MANUFACTURERS OF AND DEALERS IN EVERY DESCRIPTION OF

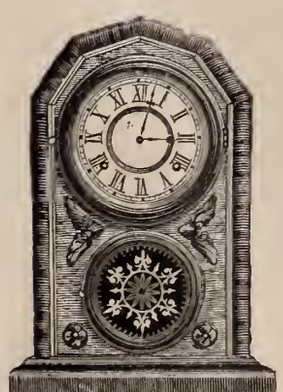
AMERICAN CLOCKS,

4 CORTLANDT ST., NEW YORK,

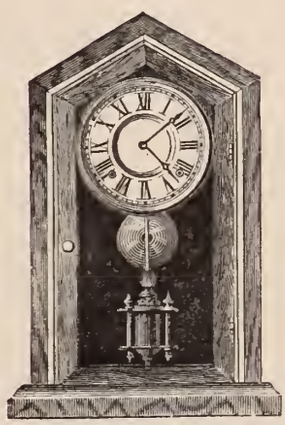
197 State St, CHICAGO.

31 & 33 Sutter St., SAN FRANCISCO.

MANUFACTORY, WATERBURY, CONN,



"CARDINAL."

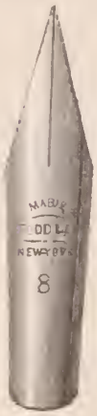


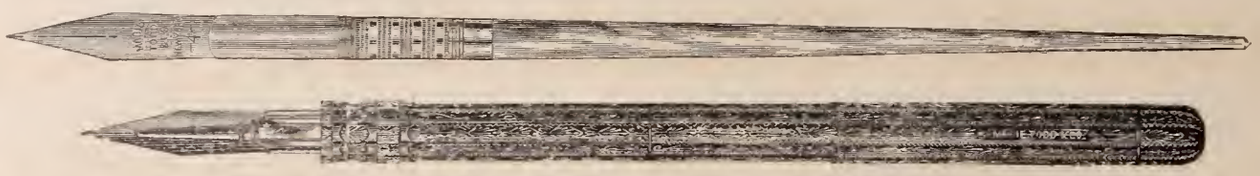
"FLORENCE V.P."

M. BAILEY, Treasurer.

SOLE AGENTS FOR THE ITHACA CALENDAR CLOCK COMPANY.

Illustrated Catalogues and Price Lists furnished to the Trade upon application.







Mabie, Todd & Bard,

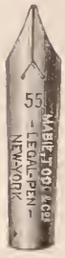
Manufacturers of

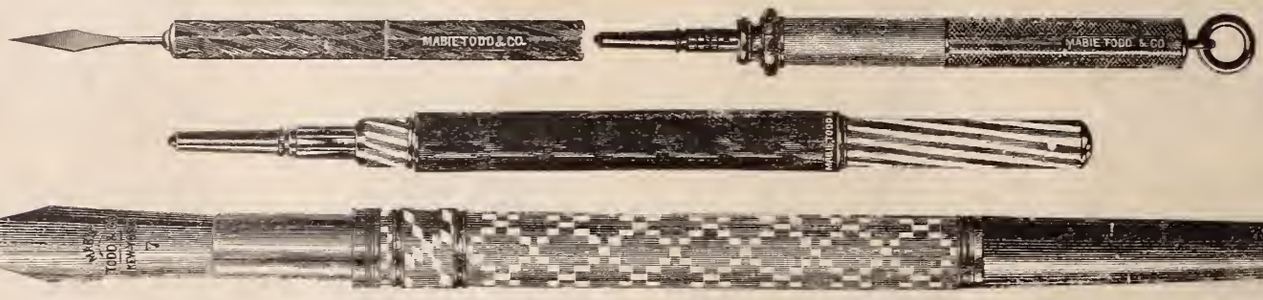
GOLD PENS,

Pen Holders, Pencil Cases and Tooth Picks,

in Gold Mounted Rubber, Pearl, Ivory and Solid Gold,

180 Broadway, **New York.**





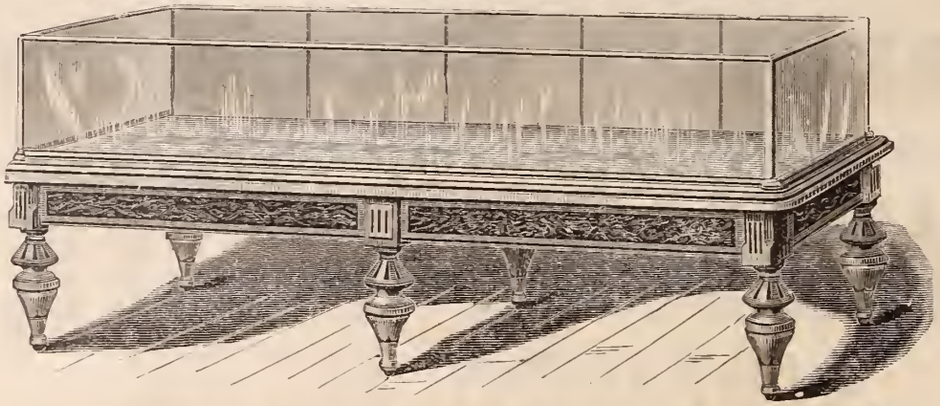


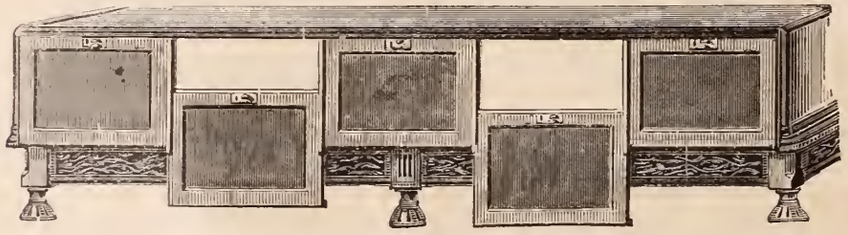
We were awarded a Medal & Diploma, at the Centennial Exhibition, for excellence of designs, and high quality of workmanship.

Illustrated Catalogues and Price Lists sent to the trade upon application.

PATENT IMPROVEMENT IN COUNTER SHOW CASES,

PERPENDICULAR SLIDING DOOR, DUST-TIGHT.





REAR VIEW OF CASE SHOWING SLIDING DOOR.

Its advantages are as follows:—The doors are more conveniently opened and closed, less liable to get out of repair or broken, articles are more easily reached in wide cases, mirrors are more safe, it dispenses with hinges, economizes room, excludes dust, and is air tight *when closed.*

☞ Drawings furnished and estimates given for fitting stores in cabinet work complete.

REFERENCES: { GORHAM MF'G CO. / ROGERS & BRO. / MITCHELL, VANCE & Co.

B. & W. B. SMITH,

220 West 29th Street, New York.

Ansonia Clock Company,

MANUFACTURERS OF AMERICAN CLOCKS,

And IMPORTERS of CLOCKS of EVERY DESCRIPTION.

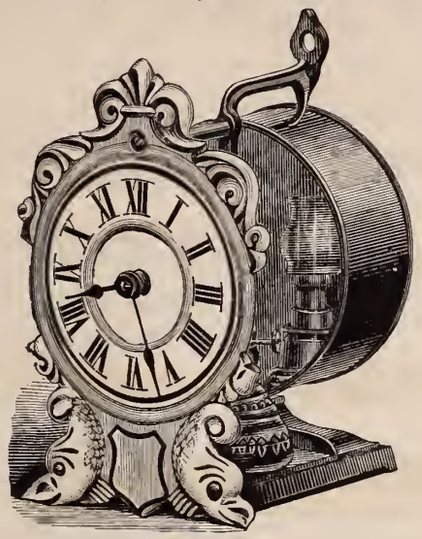
SALESROOMS: 19 & 21 CLIFF STREET, and 5 CORTLANDT STREET, (Near Broadway) **NEW YORK.**

FACTORIES ANSONIA, CONN., and 10th STREET, NEW YORK.



Peep O'Day Alarm.

One-half the size: Stem-Winding: Sets the alarm and winds at the back. "Only requires one spring" to be wound, and will go in any position.



Illuminated Night Light Clock.

For either Gas or Oil Lamp; will go in any position; Stem-winding.

Patented January 17th, 1878.



Alert Alarm,

One-half the size.

BELL INSIDE OF CASE; STEM-WINDING. Sets the alarm and hands at the back. "Only requires one spring to be wound," and will go in any position.

The above are excellent Time-keepers. Illustrations and prices on application.

A NEW LINE OF NOVELTIES WILL SHORTLY BE OFFERED.

LOUIS STRASBURGER & CO.,

Importers and Makers of Watches,

OF EVERY DESCRIPTION,

From the Finest Stem-Winding and Setting Goods to the Lowest Priced Watch in the Market.

OUR STOCK is unusually complete and attractive and embraces an assortment of the best COMMERCIAL WATCHES to be found anywhere ranging from $4.00 to $600 each.

We would also call the attention of buyers to our select display of fine TIMING and COMPLICATED WATCHES, CHRONOGRAPHS and REPEATERS, of every description, from the establishments of the most eminent makers.

☞We are also the Sole Agents for the INTERNATIONAL WATCH CO.'s WATCH, so well and favorably known in this market.

LOUIS STRASBURGER & CO.,

NO. 15 MAIDEN LANE, NEW YORK.

Diamond Bureau,
No. 30 Boulevard Houseman,
PARIS.

WATCH FACTORY,
CHAUX DE FONDS, SWITZERLAND.



Silver-Plated Ware.

THE MERIDEN BRITANNIA COMPANY,

Union Square, New York,

(No. 46 East 14th Street).

ARE MANUFACTURING AND HAVE ON EXHIBITION A CHOICE SELECTION OF DESIRABLE ARTICLES ESPECIALLY APPROPRIATE for the SEASON.



Centennial Medals and Diplomas were awarded to this Company

FOR "SUPERIOR" SILVER-PLATED WARE.

EXTRACT FROM CENTENNIAL JUDGES' REPORT.

"Their LARGE VARIETY of Silver-Plated White Metal Hollow Ware is of EXCELLENT QUALITY and FINISH, and of TASTEFUL DESIGNS."

"Their Silver-Plated Forks, Spoons and Knives are of SUPERIOR QUALITY and EXCELLENT FINISH. Their XII PLATING, or extra plating on exposed parts, *deserves commendation.*"

EXTRACTS FROM AMERICAN INSTITUTE REPORT.

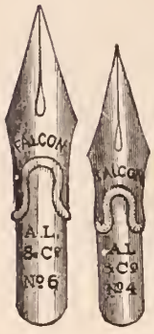
"The Porcelain-Lined, Double Walled Ice Pitchers are A 1, and possess all the qualities the Company claim."

"We consider the Goods made by this Company by far *the best* made in this country, and, we believe in the world."

☞ First Premiums awarded at all Fairs where Exhibited, from World's Fair, 1853, to American Institute Fairs, 1873, 1874 and 1875, inclusive, and at Philadelphia Centennial Exhibition, 1876.

Factories, West Meriden, Conn.

SPRING TRADE, 1878.



J. C. AIKIN, H. A. LAMBERT, J. B. SHEA.

AIKIN, LAMBERT & Co.,

MANUFACTURERS OF

Gold Pens, Pencil Cases, Holders, Pencils, Picks,



And RELIABLE JEWELRY in great variety,

THE LATEST NOVELTIES!

Patent Egg Pencil Charms, artistically mounted in Celluloid and Florida Beans.



CLOSED.



FLORIDA SEA BEAN.



OPEN.

Pencil Charms, Watch Keys, Masonic Emblems, Initials, &c.

Our system of furnishing Show Case assortments, and establishing agencies, is broad, liberal and advantageous, and, as the originators of that method of display, now so popular with the Trade, we are offering liberal inducements to Agents. Prices recently reduced.

Illustrated Catalogues and Price Lists furnished upon application. Correspondence invited. Goods sent on approval when desired.

No. 12 MAIDEN LANE, NEW YORK.

SUPERIOR ELECTRO-PLATE!

MANUFACTURED BY

THE MIDDLETOWN PLATE COMP'Y,

Factories, MIDDLETOWN, Conn.

Salesrooms, { 13 John Street, New York.
120 Sutter Street, San Francisco.

SUPERIOR HARD WHITE METAL,

SUPERIOR HEAVY PLATE,

SUPERIOR DESIGNS, WORKS OF ART.

Wedding and Fancy Presentation Pieces in Elegant Designs.

Our assortment of Tea Sets, Urns, Butter Dishes, Syrup Cups, Baskets, Pitchers, Waiters, Goblets, Fruit and Berry Dishes is complete in **new designs.**

Our Patterns are Original! **Photographs sent dealers on application!**

SIMPSON, HALL, MILLER & CO.

Fine Electro-Silver Plated Ware,

Factories, Wallingford, Conn. Salesroom, No. 676 Broadway, N. Y.

One of the oldest and most reliable manufactories in the country.

Our Solid Table Ware is made of the Best Nickel Silver.

Spoons, Forks, Ladles, Pie Knives, &c.

IN GREAT VARIETY OF PATTERNS.

Solid Steel Knives, superior article and Heavily Plated for Service.

OUR HOLLOW WARE consists of Tea Sets, Urns, Tea Trays, Spoon Holders, Milk and Water Pitchers, Butter Dishes with glass plates, Cake Baskets, Biscuit Bowls, Berry Dishes, Fruit Stands, Pickle and Jelly Dishes, Dinner and Breakfast Castors, Oyster and Soup Tureens, Baking Dishes, Steak Dishes, Vegetable Dishes, Celery and Salad Dishes, Syrup Cups, Tray and Rack for holding Spoons and Forks, also with Call Bell attached (patented). Toilet Sets in great variety of patterns, beautiful glass, richly mounted with silver, Vases, Card Stands combined. The glass Vases are of various patterns and styles; cut and fancy, of the most beautiful designs and mounted in the most elegant silver frames and stands. Centre Pieces and Epergnes, the most elaborate or plain, as desired; in fact thousands of articles in the line of Silverware, and all warranted to be first-class and exactly as represented.

☞ Our facilities being second to none to produce the finest and most serviceable *ELECTRO-PLATED WARE*, at the lowest possible price. By years of experience, close attention to business, and our unsurpassed facilities, we are enabled to produce goods as cheap, if not cheaper, than any other concern in this country, consequently dealers can feel assured that they will always get goods from us at the very lowest price. The pride of our house is to make the finest goods, and sell them at fair prices, and please our customers, by honorable dealings, and retain the reputation which, we believe, is unquestioned as to our making the best of goods and also the cheapest.

PATENT BUTTER DISH.

The annexed cut represents an entirely new and novel Butter Dish. The convenience of its opening and closing can but strike one favorably. Its beauty of design and workmanship must please everybody. We have produced other valuable designs and patents in the way of Butter Dishes as well as many other useful articles in our line, but this is the most complete and perfect in its arrangement of anything heretofore produced, and must take the lead of all other first-class Butter Dishes in the market.



DAVID F. CONOVER & CO.,

(Successors to Wm. B. Warne & Co.)

Importers, Manufacturers and Wholesale Dealers in

WATCHES AND JEWELRY.

Silver and Silver-Plated Ware,

American Watch Wholesale Salesroom,

Southeast Corner Chestnut and 7th Sts.,

(FIRST FLOOR.)

David F. Conover,
B. Frank Williams,
C. Edgar Righter.

PHILADELPHIA, PA.

Hampden Watch Co.

SPRINGFIELD, MASS.

Manufacturers of all Grades of Movements.

SALESROOM,

No. 12 John Street, New York.

GORHAM MANUFACTURING CO.

SILVERSMITHS,

NEW YORK AND PROVIDENCE.

Manufacturers of Sterling Silverwares of the highest character and in all branches of the art. Also makers and sole Proprietors of the GORHAM PLATED WARES, so well and favorably known to all dealers. In Silver Goods our stock is unusually complete and attractive, embracing an extensive assortment of Silver Hollow Ware, of exquisite design and finish, comprising large single pieces for presentation purposes, and complete services in Tea, Dinner and Dessert Ware, etc., and from which we can supply *immediately* any demand by *mail* or *telegraph*.

Dealers availing themselves of these advantages are enabled to offer customers a select display of goods, which often results in large sales. We would call attention to our lithographic circular on another page of this Journal, containing two of our latest designs in Spoons and Forks. Each of these patterns has artistic merits that especially recommend them to the best class of trade.

ILLUSTRATED CIRCULARS, showing our complete line of Spoon Patterns, together with price and weight list, will be sent to the Trade *only*, upon application. We are now making the largest line of successful patterns of spoons and forks on the market, and our business in these goods, for the past season, has exceeded that of any previous year. All Solid Silver Goods of our manufacture are GUARANTEED absolutely to be of the English Standard, $\frac{925}{1000}$ fine.

GORHAM PLATED WARE.

This well known ware has been on this market for thirteen years, and has won an abiding reputation as the Standard ware of this City. These goods are made of Hard Metal, *Silver Soldered throughout*, and very heavily plated, and is a durable and elegant substitute for Solid Silver. Our object is to produce the *BEST ARTICLE* made in Plated Ware, the cost of production being a secondary consideration. We are enabled to make considerable reductions from former prices. We offer these Wares to the Trade as the most durable and economical Plated Ware made.

Photographs and Prices Furnished.

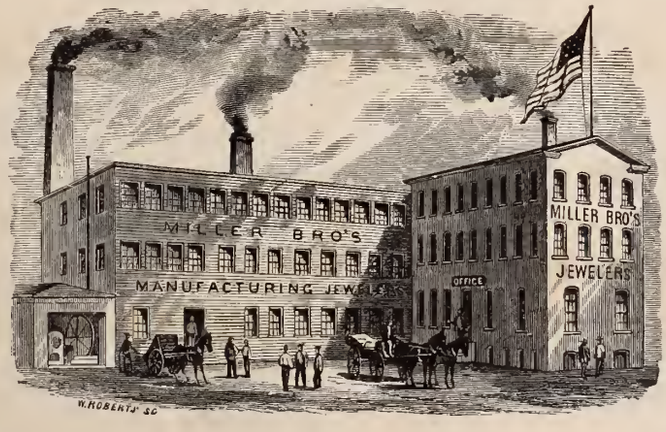
MILLER BRO'S,

MANUFACTURING JEWELERS,

No. 11 MAIDEN LANE, NEW YORK.

Manufactory, 47, 49 & 51 Franklin Street, Newark, N. J.

INITIAL GOODS



A SPECIALTY!

Seals, Lockets, Sets, Sleeve Buttons, Studs, Collar and Chemise Buttons.

ATTENTION IS INVITED TO OUR

NEW STYLES OF ETRUSCAN SLEEVE BUTTONS,

MOUNTED WITH

RUSTIC LETTERS,

BIRDS, ANIMAL HEADS AND FANCY ORNAMENTATIONS.

Sussfeld, Lorsch & Co.,

IMPORTERS OF

Optical and Mathematical Instruments,

Watchmakers' Tools, Materials, Watch Glasses, &c.

No. 13 Maiden Lane, New York.

Sole Depot in the United States for
BARDOU & SON'S
Universal Opera Glasses,
U. S. ARMY & NAVY SIGNAL GLASSES,
&c., &c.

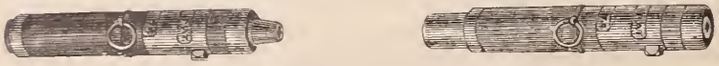
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TRADE MARK

Sole Depot in the United States for the
CELEBRATED
Crown Spectacles and Eye Glasses,
OF ALL GRADES.

TRADE MARK

Commission Merchants at 27 Rue de Paradis, Poissonniere, Paris.

NORCROSS PATENT DUST-PROOF KEY.



KEY OPEN. Patented July 14th, 1874. KEY CLOSED.

This Key is preferred to all others, as there is no possibility of dust accumulating in the pipe. It will not break or wear like other Keys, being made of Stub's steel, hardened and tempered.

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MANUFACTURERS OF GOLD CHAINS,

AND

FINE ETRUSCAN JEWELRY,

Nos. 182 and 184 BROADWAY,

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NOAH MITCHELL,

MANUFACTURER OF

Fine Gold Jewelry

CAMEO SETS, ONYX GOODS,

Medallions, Studs, Sleeve Buttons, Rings and Diamond Settings of all Kinds.

DIAMOND SETTING A SPECIALTY.

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(WHITING SILVER MF'G CO.'S BUILDING.)

ALL ORDERS PROMPTLY ATTENDED TO.

CLEMENS OSKAMP,

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IMPORTER & WHOLESALE DEALER IN WATCHES,

CLOCKS, MATERIALS & OPTICAL GOODS.

No. 175 Vine Street,

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MANUFACTURERS OF

THE CELEBRATED WOVEN FABRIC

GOLD CHAIN.

Elegantly Mounted Bracelets, Opera, Leontine,

VICTORIA WATCH GUARDS & NECKLACES, in all the Newest Designs.

☞Our stock is unusually complete, and, in addition to the above, a variety of Necklaces, from 1½ to 40 dwt. each, to which we invite the attention of buyers.

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Factory, 46 Greene Street, Newark, N. J.

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BRAINERD, STEELE & CO.,

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Brainerd's Pat. Lockets,



(Patented June 17, 1874.)

These Lockets combine both beauty and strength. They are made of solid 14kt. gold, and the stones used are the finest obtainable in the market. They cost no more than those of the old style, if indeed as much; and the combination of secrecy and durability renders them much more desirable. We make three sizes in four different shapes—round, oval, cushion and oblong square; and also Sleeve Buttons of the same style, containing a concealed box for miniatures, a novelty new to the Trade.



FINE GOLD JEWELRY,

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ESTABLISHED 1837.

VICTOR BISHOP & CO.,

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CORAL JEWELRY,

Imitation Stones, Roman Pearls.

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ENAMEL OF ALL COLORS AND QUALITY.

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House in Paris, 66 Boulevard de Sebastopol.

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Importers of Watches,

MANUFACTURERS OF JEWELRY,

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Jobbers in all grades of American Movements,

GOLD AND SILVER CASES.

Gold Chains, Jewelry, Diamonds, Clocks, Silverware, &c.

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☞Prompt and careful attention given to filling orders for all kinds of goods pertaining to the trade. Goods sent on approval when satisfactory references are furnished.

☞ Designs and estimates given, and special attention paid to orders from jewelers for Watches, Badges, etc., desired for presentations

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MANUFACTURERS OF

Fine Gold Chain.

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Factory, No. 183 Eddy Street, Providence, R. I.

☞ **Sole Agents for the new PATENTED CHAIN BAR, containing a Detachable Pencil.**

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KREMENTZ & CO.,

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SILVERSMITHS,
WORKS & WAREROOMS,
Broadway & Fourth St., New York.
WHOLESALE ONLY.

SMITH, HEDGES & CO.,
IMPORTERS OF
DIAMONDS
Which are offered to the Trade, mounted or unmounted.
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MANUFACTURING
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Manufacturers and Importers,
FINE SWISS WATCHES,
REPEATERS, CHRONOGRAPHS & CALENDARS.
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Sole Agents for the James Nardin Watch.
House in Geneva, 14 Grand Quai.

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MANUFACTURERS OF
RICH JEWELRY,
(WHITING BUILDING),
No. 694 Broadway, corner 4th Street,
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Stone and Stone Cameo Goods, Rings, Necklaces, Colored and Etruscan Work, Etc.
FIRST-CLASS GOODS OF OUR OWN MAKE
EXCLUSIVELY!

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MANUFACTURERS OF
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Diamond and Stone Cameo Goods,
GOLD CHAINS, &c.
Importers of Diamonds, Pearls, Emeralds, Rubies, &c.
WHITING BUILDING,
Cor. Broadway and Fourth Street,
NEW YORK.

THE

Adams & Shaw Company,

SILVERSMITHS,

694 BROADWAY, ... NEW YORK.

THE ADAMS & SHAW COMPANY have prepared expressly for the current wedding season a fresh and brilliant line of Sterling Silver Ware.

THE ADAMS & SHAW COMPANY manufacture for the trade exclusively and decline to sell at retail.

THE ADAMS & SHAW COMPANY will stamp the name of their customers upon goods and cases, whenever practicable to do so.

THE ADAMS & SHAW COMPANY ask especial attention to their Spoon and Fork patterns, which are conceded to be the most successful in the market.

THE ADAMS & SHAW COMPANY are prepared to furnish designs and estimates for Testimonials, both public and private, military and long-range rifle matches, Race Cups, etc., etc., upon application. They have for this purpose a rich variety of decorative patterns and designs, accumulated through twenty years manufacturing of fashionable testimonials, affording special advantages to customers in point of beauty and economy.

THE ADAMS & SHAW COMPANY also make the very finest Hard Metal, Silver-Soldered Plated Ware in special designs. They were the first to discard entirely the use of soft solder in soldering the joints, mounts, etc., and no such weak spot or defect can be found in any piece of ware ever made by them. They received the highest award, Medal and Diploma, at the Centennial Exhibition for Hard Metal, Silver-Soldered Electro Plate.

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MANUFACTURERS OF

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AND DEALERS IN

AMERICAN AND SWISS WATCHES,

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ENOS RICHARDSON & CO.

MANUFACTURERS OF

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COLORED AND ETRUSCAN WORK.

All Goods sold strictly of our own manufacture.

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ONYX GOODS A SPECIALTY!

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ETRUSCAN GOLD AND CORAL SETS, ROMAN BRACELETS, NECKLACES, &C.

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No. 126 Kearny Street, San Francisco, Cal.

Established 1813.

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DESIGNS FURNISHED AND ESTIMATES GIVEN.

Special attention paid to orders for Badges, Medals, &c.

Diamond and Pearl Mountings a Specialty.

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No. 12 John Street, New York.

Specialties!

FINE LINKED SLEEVE BUTTONS, ROMAN BAND BRACELETS, LOCKETS & CROSSES.

N. B.—We desire to call the attention of the Trade to our IMPROVED BRACELET CATCH, and our new styles of Link Sleeve Buttons.

Established 1846.

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Chatterton & Dodd,

(Successors to Fitch & Chatterton).



Manufacturers of Fine Gold Jewelry

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WHITE ENAMEL STUDS & BUTTONS,

Linen Finished and

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Sole Agent for { LONGINES WATCH COMPANY. "AGASSIZ" LADIES' STEM-WINDERS. Louis Audemars' Fine and Complicated Watches.

LONGINES NICKEL METAL STEM-WINDERS of various sizes and styles, pronounced unsurpassed for quality, durability and price

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Importer of Swiss Watches,

TOOLS AND MATERIALS, SILK GUARDS, &c.

And Jobber in all grades of American Watches.

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In addition to our line of **SWISS KEY AND STEM-WINDING WATCHES, and Materials of all kinds,** we have a large stock of the celebrated **PIONEER Stem-Winding and Stem-Setting Watches** (manufactured expressly for us) and pronounced by competent workmen to be the best watch for the money in the market. They are cased in silver and German silver hunting or opened faced. **Send for Prices.**

Full Trade Discounts on American Watches.

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WATCHES.

Fine Movements a SPECIALTY. ¼ seconds, Chronographs and Extra Fine Silver Watches always in Stock. Goods sent on approval, satisfactory N.Y. City references being furnished.

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FACTORY, Rue des Envers, Locle, Switzerland.

MATHEZ
Watch Company,

Of NEW YORK.

Gents' and Ladies' Stem-Winding Movements

STRAIGHT LINE, 3-4 PLATE NICKEL.

These Movements are of six different grades, uniform in size and beautifully finished, and will be SOLD AT LOWER PRICES than any other goods of similar excellence.

☞A FULL LINE of materials for our movements always kept in stock for the convenience of those using our goods.

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WATCH MATERIALS, TOOLS AND GLASSES,

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(UP STAIRS),

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Sole Importer of the TELL A. BEGUELIN'S BEST MAINSPRINGS.

☞Every description of Watches carefully repaired for the Trade.

ESTABLISHED 1845.

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MANUFACTURERS AND IMPORTERS OF

Fine Swiss Watches



SOLE IMPORTERS OF THE

AUGUSTE SALTZMAN
VICTOR VUILLAUME
ALBERT VUILLE } Watches

SPECIAL NOTICE.

The Trade is respectfully notified to beware of imitations of the name of Saltzman, marked on Watches of an inferior grade, and purporting to be the genuine Saltzman.

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J. A. BROWN & CO.

OFFICE AND SALEROOM: No. 11 Maiden Lane, N. Y.
FACTORY: No. 104 Eddy St., Providence. R. I.

SOLE MANUFACTURERS OF THE

Ladd Patent Stiffened Gold Watch Cases



For the Movements of the various American Watch Co.'s, in full and three-quarter plate, Gent's, Ladies' and Boys' sizes, Key and Stem-Winders, and in the following styles, BASCINE, FLAT-BEVEL and MANSARD, (this latter as originally named, modeled and introduced by them) forming the most complete and varied line of elegant Cases ever offered for sale. It is now ten years since these Watch Cases were introduced to the public, during which period of time they have steadily gained in popular confidence and esteem. Made of thick plates of Gold and Nickel Composition, thoroughly welded together and rolled to the required thickness—they are, while equally handsome—stronger and more durable than the finest Solid Gold Cases of the same thickness of metal, and at ONE-THIRD or ONE-HALF the COST, and with good movements, they make the cheapest, most elegant and serviceable Watches in the market. The critical examination of these goods by the trade and public is invited with entire confidence that the verdict of approval of their merits will be unanimous now, as ever before.

FOR SALE BY JEWELERS GENERALLY.

☞Dealers can obtain them of the Wholesale Watch and Jewelry Houses, or their Traveling Agents, throughout the United States and British Provinces.

☞All genuine Watch Cases of our manufacture, have "G. W. Ladd's Patent, June 11th, 1867," stamped upon the side band underneath the glass bezel.

Refuse all others. Send for full Descriptive Circular.

TO THE TRADE.

We desire to call the attention of the Trade to our new importations of WATCHMAKERS' AND JEWELERS' TOOLS AND MATERIALS. of all kinds; also to our line of Swiss WATCHES, especially adopted to the requirements of all classes of trade.

Our stock of WATCHES comprises the names of Henry Beguelin Droz & Perret, N. Robert, and other well-known makers whose productions have achieved a high reputation in this market.

We are also dealers in all grades of AMERICAN WATCHES, on which we give the FULL *Trade Discount.*

We would especially direct attention to our "CENTENNIAL" WATCHES, of our own make, Stem-winding and Stem-Setting. cased in silver and German silver, and an excellent and accurate timepiece. Send for Price List.

☞ *A full line of Rogers & Bro.'s Plated Goods.*

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NATHAN E. MORGAN. CHAS. B. HEADLY.

MORGAN & HEADLY,

MANUFACTURERS OF

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FINE JEWELRY, CHAINS, BRACELETS,

18 Karat Plain Rings, &c.

Artisan Hall, 611 & 613 Sansom Street,

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☞A full line of *DIAMONDS,* mounted and unmounted, always on hand, which we will send on approval to the Trade, on receipt of reference.

LOUIS A. SCHERR. CHAS. H. O'BRYON. G. W. SCHERR.

LOUIS A. SCHERR & CO.

Importers and Wholesale Dealers in

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Spectacles, Silk Guards, &c.

Wholesale Agents for American Watches.

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SOLE AGENTS FOR JACQUES LE COULTRE RAZORS.

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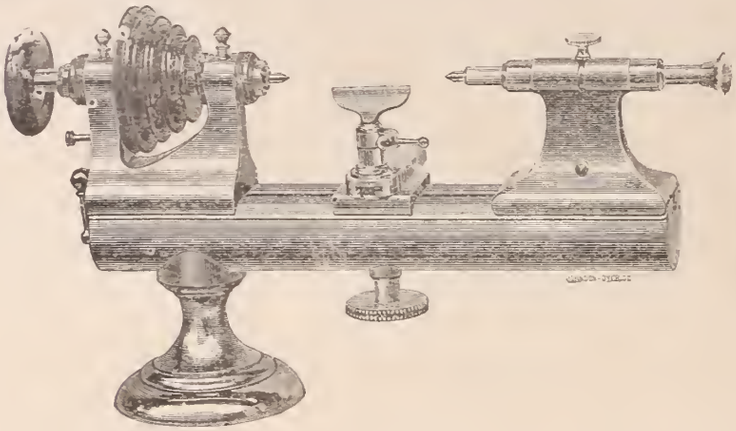
Nos. 68, 70 and 72 Wooster Street,

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American Watch Tool Co.

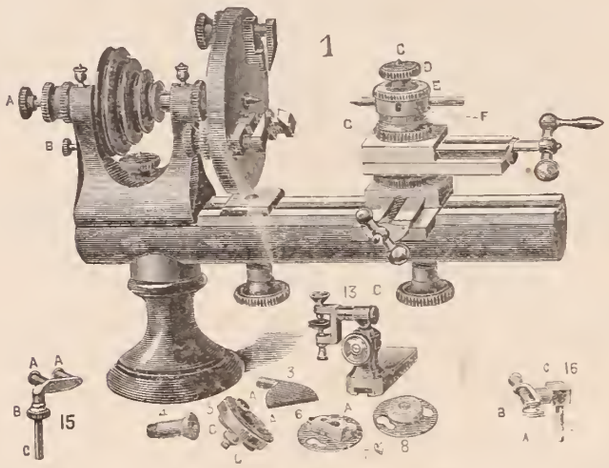
Formerly J. E. Whitcomb & Co.

Manufacturers of Watch & Chronometer Makers' Tools.



P. O. Box 999. WALTHAM, MASS

HOPKINS' WATCH TOOL CO



Manufacturers of HOPKINS' PATENT WATCHMAKERS' TOOLS, embracing Plain and Combination Lathes, Chucks, Slide and Swing Rests, Gear Cutters, Pivot Polishers, Jeweling and Staking Tools, &c.
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HOPKINS' WATCH TOOL CO., Waltham, Mass

Medal and Diploma of Merit Awarded by Centennial Com.

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MANUFACTURER OF FINE

CASES

For Jewelry, Silver Ware, Trays, &c.

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BROADWAY,

NEW YORK.



BOREL & COURVOISIER TO THE FRONT!

SWISS WATCHES

AGAIN RANK AS THE BEST.

IMPROVED MACHINERY HAS DONE THE WORK.

☞We are happy to inform our agents and patrons that the **new B & C.** are now ready. ALL ORDERS CAN BE FILLED AT ONCE! We are authorized to make a considerable reduction from former prices, in order to place them within the reach of all.

☞**Dealers wishing to act as authorized agents for the sale of these celebrated Watches and Movements will be furnished with full particulars by addressing, with business card,**

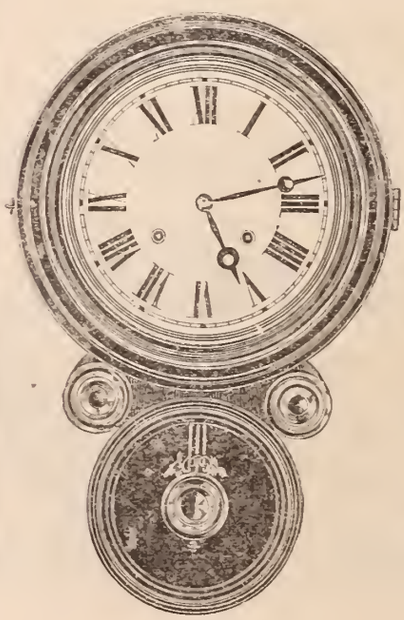
QUINCHE & KRUGLER,

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Sole Agents in the United States.



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Of Every Description.

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H. HOWARD & CO.,

MANUFACTURERS OF

Fine Gold Jewelry

No. 14 JOHN STREET, New York.

☞ Factory, 102 Orange Street, Providence, R. I.

H. Muhr's Sons, Philadelphia.

MANUFACTURING JEWELERS,

Solid Gold Finger Rings of Every Description.



Crown, 18k. Lion.



On and after January 1st, 1876, our make of Filled Plain Rings will be stamped as above, which stamp is copy righted. Any and every infringement on the above Trade Mark will be dealt with according to law. ☞ Every one warranted.

THESE GOODS ARE SOLD BY ALL THE LEADING JOBBERS!

Should the house that any retailer deals with not have them we will furnish them with the address of the nearest Jobber. ☞ SELL TO THE JOBBING TRADE ONLY!

New York Office, 11 Maiden Lane.

☞ Address all communications to Philadelphia.

BOOZ & THOMAS,

MANUFACTURERS OF

Watch Cases & Jewelry,

108 SOUTH EIGHTH STREET,

Second Story, **PHILADELPHIA.**

Illustrated Catalogues sent upon application.

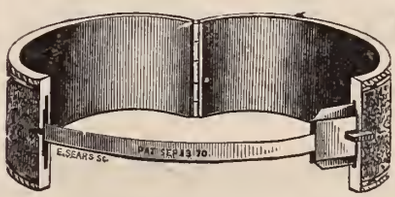
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PARTICULAR ATTENTION PAID TO REPAIRING.

Established 1845.

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Manufacturing Jeweler,

Fine Gold, Enameled and Colored Bracelets, a Specialty!

With Guard attached at NO EXTRA cost.

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Travelers' Order Books on Manifold Paper.

The order is taken in duplicate, on leaves numbered in duplicate, one of which may be readily removed, for transmission, while the other is retained in the book.

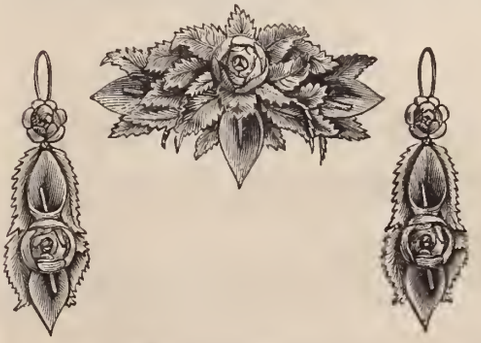
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Celluloid Novelty Comp'y,

W. S. SILLCOCKS, President. F. R. LEFFERTS, Sec'y and Treas.



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Coral Jewelry.

4 Maiden Lane, New York.

☞ Our goods are sold by all the leading jobbers in the country.

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And DIAMONDS,

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MAX FREUND & CO.,

Manufacturing Jewelers.

IMPORTERS OF

WATCHES,



Jewelry and Precious Stones

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NEW YORK.

SOLE AGENTS FOR THE CELEBRATED A. SCHNEIDER WATCH, DRESDEN.

I. PFORZHEIMER. D. KELLER.

PFORZHEIMER & KELLER,

IMPORTERS OF

Watches and Diamonds

Dealers in American Watches,

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Manufacturers of Jewelry,

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Manufacturing Jewelers,

AND IMPORTERS OF WATCHES,

No. 5 Maiden Lane,

Factory, 56 West 4th Street, **NEW YORK.**

Van Houten, Sayre & Co.,

Manufacturers of Fine Jewelry,

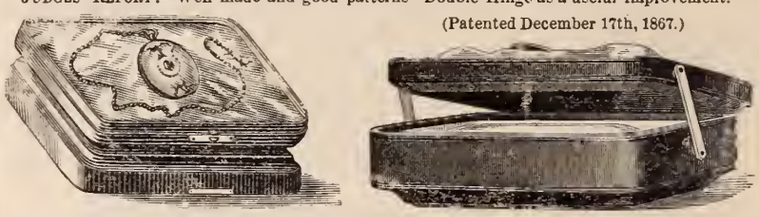
FACETED GOODS,

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ESTABLISHED 1854. ☞ Medal and Diploma Awarded at Centennial Exhibition.
JUDGES' REPORT:—Well made and good patterns—Double Hinge as a useful improvement.

(Patented December 17th, 1867.)



G. F. KOLB & SON,

MANUFACTURERS OF FINE

Morocco, Velvet and Cabinet Cases,

FOR JEWELRY, WATCHES & SILVERWARE.

TRAYS FOR SHOW CASES, TRUNKS, &C.

732 Sansom Street, PHILADELPHIA.

CRYSTAL CHANDELIERS,

Gilt, Bronze and Decorated Gas Fixtures,

FINE MARBLE AND BRONZE CLOCKS,

Bronze Figures and Ornaments in Greatest Variety, at Low Prices,

MANUFACTURED BY

Mitchell, Vance & Co.,

Nos. 836 & 838 Broadway, New York.

"Medal of Special Award," by American Institute, 1872.

No. 719, GAS FIXTURES.

MITCHELL, VANCE & Co., 597 Broadway, N. Y.:

"We find the above-mentioned Fixtures and Glass Chandeliers, for design, excellence of workmanship and finish in all their parts, to be the best production in the country and we may say, in our judgment, excelled by no other country in WORLD.

"We recommend a MEDAL OF SPECIAL AWARD for CHANDELIERS and GAS FIXTURES. (Signed) JOHN W. CHAMBERS, Secretary.

Medal of Special Award confirmed.

D. LIECHTY, B. LEVY

D. LIECHTY & CO.

MANUFACTURERS OF

Gold & Silver Watch Cases,

IMPORTERS AND DEALERS IN

SWISS & AMERICAN WATCHES,

No. 402 Library Street,

PHILADELPHIA.

Established 1859.

ERRICO BROTHERS,

Importers & Manufacturers of Coral, Silver Filigree and Conch Shell Jewelry of New and Beautiful Designs,

No. 19 John Street, New York. { Manufactory, 39 St. Catarina, Chiaja, Naples, Italy.

CORAL JEWELRY.—Our stock of Coral is unusually complete and attractive, embracing the widest range of styles, patterns and shades, peculiarly desirable for the requirements of this market, while our assortment of loose goods for manufacturing purposes is almost illimitable

SILVER FILIGREE.—We would call the special attention of buyers to this line of goods Our stock is one of the most complete and varied to be found in the city, and consists of Combs, Necklaces, Lockets, Pins, Earrings, Hair Pins, Charms, etc., in almost endless variety.

CONCH SHELL.—Of which we have a great variety of the most artistic designs, either mounted or unmounted. They are very desirable goods, and are competing with the finer class of stone cameos.

CONCH SHELL & ONYX.—The latest novelty introduced by us this season is a pleasing combination which promises to become exceedingly popular.

☞ Buyers visiting the city are cordially invited to examine our stock.

C. F. A. HINRICHS,

29, 31 and 33 PARK PLACE,

Cor. of CHURCH STREET, (Up-stairs) NEW YORK

Successor to M. WERCKMEISTER.

[ESTABLISHED 1801.]

IMPORTER AND DEALER IN

FANCY GOODS,

GLASS-WARE,

China, Bronzes, Clocks, Toys, &c.

Sole Agents for the Glass Factories of the Company "ANN," Namuroise, Belgium

Depot for Archery, Cricket & Base Ball Implements.

And C. A. KLEEMANN'S CELEBRATED GERMAN STUDY LAMPS

Agent for ROGER'S GROUPS in Parian, &c.

WELCH & MILLER,

MANUFACTURERS OF

Jewelry Cases,

In Morocco Velvet, Satin, Rosewood & Black Walnut,

ALSO SILVER-WARE CASES,

No. 169 BROADWAY, NEW YORK.

☞ Rosewood and Black Walnut Show Case Trays. Velvet Cases for Diamonds a specialty. Catalogues sent on application.



In placing these Oils before the Trade, we do so with entire confidence, from many years' experience in procuring them from the fish, and in their preparation for use, and more than all, the thorough and SEVERE TESTS they have been subjected to in use upon Chronometers in our whale ships, often absent from fifty to sixty months. ☞ Liberal samples furnished on application.

ROSKOPF WATCH.

J. D. HUGUENIN & CO.,

GENERAL AGENTS,

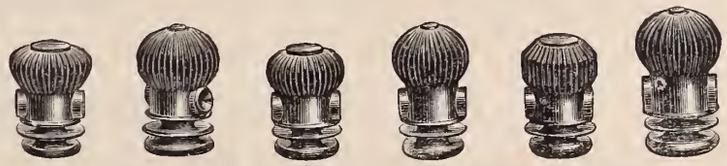
No. 12 Maiden Lane, New York.

The reputation of this Watch as an accurate timekeeper is fully established, and during the ten years that it has been before the Trade, has won an abiding reputation for fine Time-keeping qualities, and the BEST WATCH for the money in the world.

☞ Send business card for price list.

MILNE & JOURDAIN,

Manufacturers of Stem-Winding Watch Crowns



13 & 15 Franklin Street, NEWARK, N. J.

Gold Crowns, for Stem-winding Movements, to suit all sizes of Imported or American Watches, in four different styles and seven sizes.

Gold Pushers for Key Movements in every size. Also Gold Crowns for fine Chronograph Watches made to order.

☞ Silver Stem winding Crowns and Key Pushers on hand or made to order. Send for card and samples.

A. MILNE. A. JOURDAIN.

JULIEN GALLET,

Importer of Watches,

From his own Factory, Chaux de Fonds, Switzerland.

No. 25 JOHN STREET,

LEON L. GALLET.
CHARLES PERRET.
JULES RACINE.

NEW YORK.

Lubricating Oils, for Watch, Clock and Chronometer Makers.

The discovery of a Lubricator for FINE MACHINERY, such as Watches, Clocks and Chronometers, that is free from gum and corrosive substances, has taxed the ingenuity of hundreds of men whose efforts have proved a failure. But we are happy to say (being largely interested) that such an article has been supplied by MR. EZRA KELLEY, of New Bedford Mass., who, after forty years study of the subject, has perfected a Lubricator that recomends itself to all who have used the *genuine*, (there having been numerous counterfeits in the market) as witness also the award of a Diploma and Medal by the judges of the late Centennial Exhibition at Philadelphia. We have no hesitation in saying that his Oils are the BEST manufactured, always uniform in quality and capable of standing all tests applied to lubricating oils. We cheerfully recommend it to all who may in their business require a FIRST-CLASS LUBRICATOR







AMERICAN CLOCK CO., (Hine & Thomas.)

P. S.—The above Oils can be procured at all first-class wholesale Watch and Clock Establishments in the United States, as well as his only Agents GRIMSHAW & BAXTER, 5 Goswell Street, London England.

New Bedford, October 15, 1877.

Notice to the Trade.

New York, February 15th, 1878.

Our attention has been called to an advertisement in the "Toledo Blade," in which Waltham Watches are offered as premiums to Subscribers.

We desire to state that the advertisement in question is published without our knowledge or consent, and that we POSITIVELY DECLINE to sell to newspapers, grocery houses, patent medicine venders or other outside dealers, any Watch or Movement of our manufacture.

Our goods are made exclusively for the legitimate channels of trade, and are sold only to dealers regularly in the business.

ROBBINS & APPLETON,

No. 9 Bond St., New York. **No. 8 Summer St., Boston.**

No. 170 State Street, Chicago.

Waltham Building, Holborn Circus, London, England.

AMERICAN
WALTHAM WATCHES.

☞ *With a view to protecting the best interests of Retail Dealers we have published the following card, in widely circulated newspapers, very generally throughout the United States.*

A CARD TO THE PUBLIC.

In buying WALTHAM WATCHES the public will avoid imposition by observing the following indications:

FIRST.—The gold quality of every gold case made by us is distinctly stamped in figures on the back of the case, with our trade-mark, "A. W. Co.," and a certificate bearing the number of the case guaranteeing such quality, and signed by our agents, ROBBINS & APPLETON, accompanies each.

Every silver case made by us is stamped "AM. WATCH Co., Waltham, Mass.—Coin Silver," or "AM. WATCH Co., Waltham, Mass.—Sterling Silver," according to its quality, and will be accompanied by a certificate signed by R. E. ROBBINS, Treasurer, guaranteeing the same.

SECOND.—All of our movements have the name "WALTHAM" plainly engraved upon them, whatever other of our trade-marks, distinctive of grades, may be there.

This notice is rendered necessary, by the fact that certain dealers and watch-case makers are in the habit of separating our cases from our movements, and putting the cases upon worthless movements made by other manufacturers and the movements into worthless cases, also made by others than ourselves; thus in both instances making up complete watches which *bear our trade-mark upon either the case or movement, under cover of which both kind of watches are fraudulently sold, as being entirely of our manufacture.*

We, therefore, give notice that we assume no responsibility either for the quality of cases that do not bear our trade-mark, or for the performance of our own movements put into them, excepting when any fault in performance is clearly traceable to original defect in the movement itself. It is hardly necessary to say that badly-made and badly-fitting cases are sure to affect injuriously the performance of the watches—of course, we assume no responsibility for the movements other than our own, in whatever cases they appear.

We add that there is no necessity for the use of inferior cases upon WALTHAM WATCHES, as there is for their use upon Watches of Western or other American origin, the makers of which have no case-shop of their own. Our genuine cases can always be had when demanded, as they should always be demanded by those who wish to own a WALTHAM WATCH warranted in every part. Observe, therefore, that every genuine WALTHAM WATCH bears our own trade-mark in *both case and movements.*

For Sale only by Regular Watchmakers and Jewelers.

AMERICAN WATCH COMPANY,
By R. E. ROBBINS, Treasurer.



☞ *"Medal and Diploma awarded at Centennial Exposition for superior mechanical execution and artistic ornamentation."*



Established in 1854.

C. & A. PEQUIGNOT,

Manufacturers of Watch Cases.

DEALERS IN AMERICAN WATCHES AND IMPORTERS OF FINE KEY AND STEM-WINDING MOVEMENTS,

Salesroom & Manufactory, 22 South Fifth Street,

PHILADELPHIA.

A full stock of Key and Stem-Winding Gold Cases always on hand. Goods sent on approval when satisfactory references are furnished.

HOLMES, BOOTH & HAYDENS,

MANUFACTURERS OF

ELECTRO-SILVER PLATED

Spoons, Forks, Ladles, Fancy Pieces,

Solid Handle Steel Knives, &c., of the finest quality.

No. 49 Chambers Street, **NEW YORK.**

No. 18 Federal Street, **BOSTON.**

Works at Waterbury, Conn.

L. & A. MATHEY,

IMPORTERS OF FINE WATCHES AND MOVEMENTS,



Removed Feb. 1st, to 16 Maiden Lane.

Independent ¼ Seconds, Minute Repeaters, Minute Chronographs, Plain Chronographs, Double Chronographs, Independent Split Seconds, Perpetual Calendars, Pocket Chronometers.

MINUTE CHRONOGRAPHS, WITH MINUTE REPEATER.
CHRONOGRAPHS, WITH MINUTE REPEATER.
AND A FULL LINE OF MEDIUM GRADE WATCHES AND MOVEMENTS.

Sole Agents for the H. L. MATILE WATCHES.

☞Timing and Complicated Watches a specialty. All our Watches are tried and tested before delivery. ☞Goods sent for examination on satisfactory references.

"TIME AND TIME-KEEPERS," an interesting essay on the rise and progress of Watch-making, sent free to any address on application.



Established 1828.

JACOB BENNETT & SON,

Diamond Setters and Manufacturing Jewelers,

No. 108 SOUTH EIGHTH STREET, PHILADELPHIA.

WE MANUFACTURE AND MAKE A SPECIALTY OF
EVERY DESCRIPTION OF
DIAMOND MOUNTINGS
SUPERIOR IN DESIGN AND WORKMANSHIP.



MASONIC MARKS,
Presentation & Lodge Jewels,
SOCIETY AND POLICE BADGES MADE TO ORDER.
FINE WHOLE PEARL JEWELRY.

GOODS SENT ON MEMORANDUM TO ANY PART OF THE UNITED STATES.

HALL, ELTON & CO.,

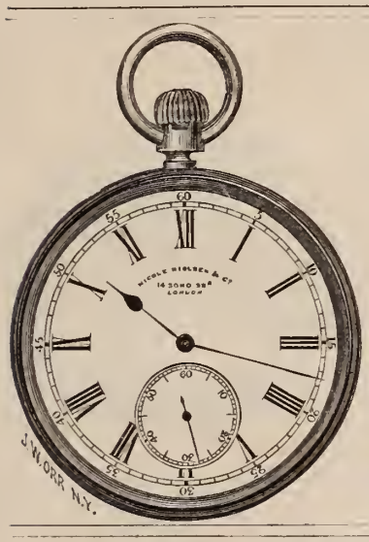
Manufacturers of the Finest Electro-Plated Ware.



The "ORLEANS."

UNSURPASSED IN QUALITY, STYLE AND FINISH!

Factories, Wallingford, Conn. Salesroom, 75 Chambers St., New York.



BARTENS & RICE;

No. 3 JOHN STREET, NEW YORK.

Importers of Watches,

Watch and Chronometer Makers.

WATCHES OF OUR OWN MAKE.

SOLE AGENTS FOR THE

NICOLE, NIELSEN & CO., LONDON WATCHES, AND FOR THE STAR WATCH COMPANY, GENEVA.

☞ Medals and Diplomas at the International Exhibitions in London '62, Paris '67, Vienna '72, Philadelphia '76.



REMINGTON'S

New Model Revolver,

CELLULOID STOCKS,

RIM AND CENTRE FIRE,

BEST & CHEAPEST REVOLVER EVER MADE.

☞ Note the Prices and you will not buy cast-iron pistols. ☜

PRICES.

38 CALIBRE.		41 CALIBRE.	
Blued	$7.50	Blued	$8.50
Full Nickle Plated	8.00	Full Nickle Plated	9 00

Liberal discount to the trade. Send for Reduced Price List and Catalogue of Breech Loading Rifles, Shot Guns, New Model Revolvers, Magazine Pistols, Ammunition, etc., Manufactured by



No. 4.

38 & 41 CALIBRE,

Just Out. 5 Shot.

Steel Frame.

E. REMINGTON & SONS, 283 Broadway, New York.

Armory, Ilion, N. Y.
St. Louis Agency, 604 N 4th St.
Chicago, 237 State St.



BIRCH'S PATENT

Self-Adjusting Watch Keys.

FOR SALE BY THE TRADE GENERALLY.



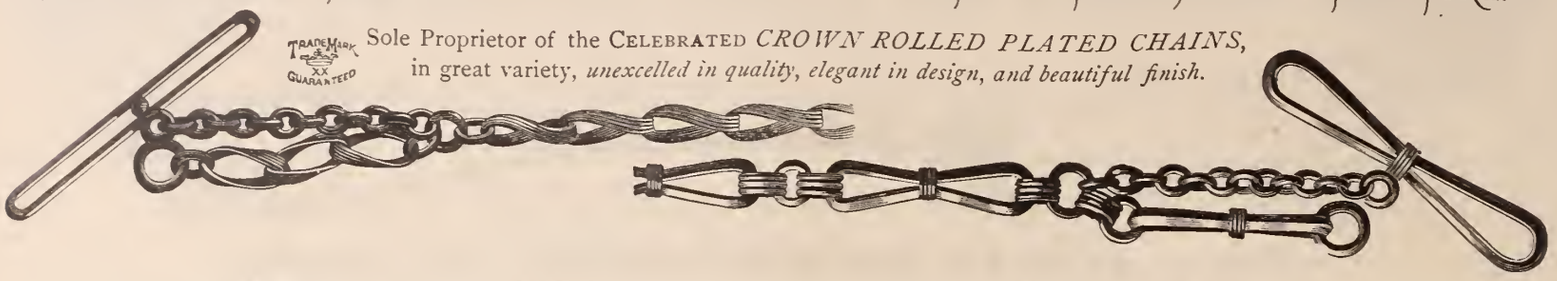
Patent articles made by Contract or on Royalty.

J. S. BIRCH & CO.,

No. 38 Dey Street, New York

HENRY C. HASKELL,

MANUFACTURING JEWELER, No. 12 JOHN STREET, NEW YORK.



Sole Proprietor of the CELEBRATED *CROWN ROLLED PLATED CHAINS*, in great variety, *unexcelled in quality, elegant in design, and beautiful finish.*

☞ *Many new patterns in VESTS, NECK AND GUARD CHAINS for the Spring Trade.*
Orders solicited for SAMPLES *on approval, and if, on receipt, not perfectly satisfactory, return at my expense.*

NICOUD & HOWARD,



Importers of Fine Swiss Watches,

No. 14 JOHN STREET, NEW YORK.

TRADE MARK.
NICOUD WATCH
No. 476

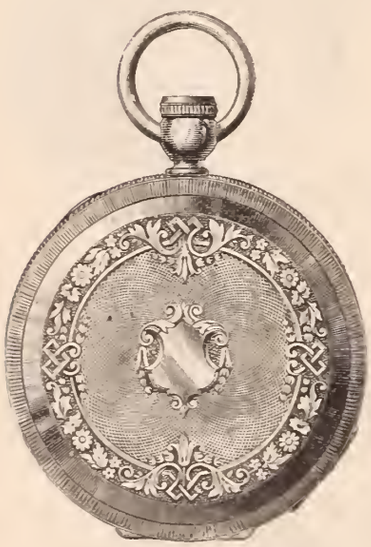


Factory, 12 Rue St. Pierre, Chaux de Fonds, (Suisse.) Established 1847.

Sole Importers of the FRED. NICOUD / ARNOLD NICOUD } WATCHES.

All Watches fully warranted as to quality of Movements and Cases.

JAS. BOSS' PATENT STIFFENED



Gold Watch Cases

ARE MADE TO FIT ALL GRADES OF

American Movements.

The Manufacturers call the special attention of the Trade to their unequalled facilities for promptly filling orders for Cases for odd Movements, and the

New Model Waltham Watches.

Respectfully,



HAGSTOZ & THORPE,

PHILADELPHIA, PA.

TIFFANY & CO.,

MAKERS OF

FINE AND COMPLICATED WATCHES.

TIFFANY WACHES (for Ladies and Gentlemen,) 3-4 Plate and Bridge Movements.

MINUTE REPEATERS.

FIVE MINUTE REPEATERS,

QUARTER HOUR REPEATERS,



INDP'T FIFTH SECONDS,

INDP'T QUARTER SECONDS,

CALENDARS (Perpetual).

REPEATERS WITH CHRONOGRAPHS, &c.

CHRONOGRAPHS.

(FLY-BACKS.)

Single, Split-Second, Minute and Second, and with Repeaters.

THE TIFFANY CHRONOGRAPHS are conceded by all to be the most accurate and reliable *TIMING WATCHES*, and very generally used for sporting and scientific requirements.

The STANDARD TIFFANY WATCHES are constructed upon the most approved scientific principles, combining simplicity, strength, durability, and time-keeping qualities.

The simplicity of construction renders them less liable to get out of order than more complicated Watches, and reduces the cost to the minimum at which Watches of the same grade can be produced.

☞ *Goods sent for selection or examination and Price Lists forwarded on receipt of satisfactory references. Orders for engraving, ornamenting or refinishing nickel movements, and engraving inscriptions, devices, and monograms on cases promptly attended to.*

Works at Geneva, Switzerland.

Wholesale Office, 14 John Street, New York.

GEO. R. COLLIS, Manager.

☞ **We are General Agents for Messrs. Patek, Philippe & Co., Geneva, Switzerland, a full line of whose Watches will be found at our Wholesale Office, 14 John Street.**

Spring Novelties.

We would respectfully announce to BUYERS that we have JUST OPENED a large invoice of

Marble Clocks and Timepieces.

The latest Parisian NOVELTIES embracing the newest colors of Marble and the latest designs in ornamentation. Also a very fine line of Bisque Statuettes, Clocks and Sets, in the most desirable decorations.

We would also direct attention to our select assortment of Candelabras in Bisque, Brass, Imitation and Real Bronze and Silver.

Our buyer, now in Europe, has been fortunate in securing a very choice selection of the celebrated HAVILAND FAIENCE, embracing a number of exquisite examples in colors.

☞ Many other Novelties will arrive during the next three weeks, all of which have been specially selected for this season's trade.

Photographs and Price Lists of Clocks sent on application.

LE BOUTILLIER & CO.,

Importers & Jobbers,

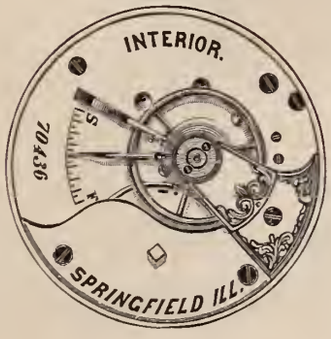
No. 3 UNION SQUARE, NEW YORK.

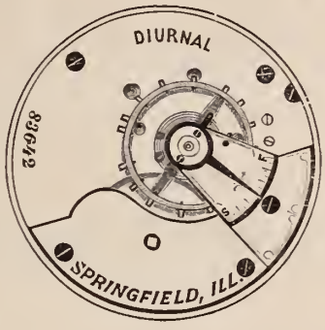
ILLINOIS

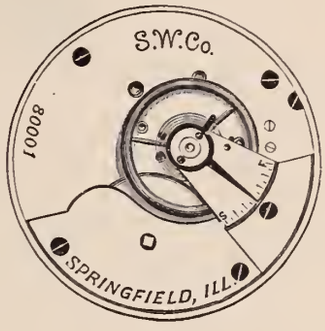
Springfield Watch Company,

MANUFACTURERS OF

KEY AND STEM-WINDING MOVEMENTS.







ALL GRADES GILDED THROUGHOUT, AND HAVE HARD PLATES.

The above grades are again reduced in price, February 1st, and are guaranteed to be

THE MOST DURABLE LOW-PRICED MOVEMENTS IN THE MARKET!

Special attention is called to the fact that this Company furnishes no Movements or Watches, on any terms, to Newspapers or Periodicals with which to interfere with sales of regular dealers.

☞ *Please apply to your nearest wholesale dealer for price list.*

OFFICES.

11 MAIDEN LANE,
New York.

172 STATE STREET,
Chicago.

SPRINGFIELD, ILLS.

REMOVAL.

E. AUG. NERESHEIMER,

IMPORTER OF

DIAMONDS,

Has Removed from No. 5 to

No. 21 MAIDEN LANE,

New York.

GEO. W. SIMONS.

PETER B. SIMONS.

FREDERICK M. SIMONS.



JOHN SPEICKER.

JOHN F. SIMONS

GEO. W. SIMONS, Jr.

SIMONS' BROTHERS & CO.

MANUFACTURERS OF

Gold Chain and Jewelry,

611 & 613 Sansom Street,

PHILADELPHIA.

Awarded Medal and Diploma

CONSOLIDATION!

We would announce to the Trade that the firms of SIMONS, BROTHER & CO., and SPEICKER, SIMONS & BRO., have this day been combined, and will continue under the firm name of SIMONS, BROTHERS & CO., to manufacture all the Specialties for which the two houses have an established reputation. We have made very extensive factory improvements, and will be able to insure our friends that satisfaction which is guaranteed by dealing with a first-class house. Address,

SIMONS, BROTHERS & CO., 611 & 613 Sansom Street, Philadelphia.

MANUFACTURERS AND JOBBERS OF

Gold and Fine Rolled Plate Jewelry.

RINGS A SPECIALTY!

Diamonds, Pearls, Cameos, Amethysts, Garnets, &c.

GOLD FRONT and ROLLED PLATE CHAINS IN LARGE VARIETY.

N. B.—Goods sent on selection to any part of the United States on receipt of satisfactory New York reference.

KOSSUTH MARX & COMPANY.

MANUFACTURERS OF THE

STANDARD

AMERICAN SILK GUARDS,

No. 39 Maiden Lane, New York.

Vulcanite Jewelry Co.

MANUFACTURERS OF

WHITBY JET,

Combination Whitby Jet and Vulcanite,

Byron's Patent, May 18, 1869,

Also a full line of Lockets—plain, gold mounted and monogram.

No. 191 BROADWAY, N. Y.

☞ Agents for the NEW RUBBER WATCH CASES, Fitting all American Movements.

CHARLES KNAPP,

Engraver, Diesinker and Stamper

FOR JEWELRY PURPOSES.

Manufacturer of Shanks and Heads for Seal and Diamond Rings.

Sample Cards always on hand.

☞ **Superior Carved and Fancy Band and Children's Rings, with very elaborate designs, a Specialty.**

☞ Fine Engraving and Enameling Work done.

41 Maiden Lane, N. Y.

GEO. E. WILKINS,

Importer of Fine

Tools for Watchmakers,

CUTTING AND DIVIDING ENGINES.

Rounding-up Tools and Cutters, also Cutters for Stem-winding wheels.

Fine Lathes with the American system of Chucks.

Dividing Engine and Rounding-up tool combined.

MARINE CHRONOMETERS FOR SALE.

Special Tools imported to order.

21 South Salina St., Syracuse, N. Y.

Mansard English Geneve Louis XV.



HENRY LEFORT,

Stem-Winding Watch Crown Manufacturer,

Crowns and Pushers in gold, all sizes, quality and color, made to order. Silver crowns and pushers always on hand.

☞ Samples sent on application.

80 & 82 Marshall Street,

NEWARK, N. J.

HENRY ZIMMERN,

IMPORTER OF

Watch Materials,

TOOLS, GLASSES, SILK GUARDS,

Spectacles & Eye Glasses,

No. 8 Maiden Lane, N.Y.,

FIRST FLOOR.

Sole Importer of the A. Hugenin & Gravier Mainsprings

J. SABIN & SONS,

Booksellers and Importers

84 Nassau St., N. Y.

14 York Street, Covent Garden, London.

Keep constantly on hand

A large stock of Works in General Literature, Illustrated Books, and Works on Art, Architecture, Decoration, and Design.

Racinet's Poly-Chromatic Ornament, and Owen Jones' Grammar of Ornament.



MOORE & HORTON,

11 MAIDEN LANE,

NEW YORK,

Manufacturing Jewelers.

SPECIALTIES.

Stone Cameos, Onyx, Amethyst, Topaz and Pearl.

☞ Also our new imitation fac-simile of Fine African Diamonds, mounted in Rings, Studs, Pins, Ear-Rings, Collar and Sleeve Buttons, &c.

Leon Jeanne. Paul Jeanne.

JEANNE BROTHERS,

MANUFACTURERS OF

Diamond Mountings And RICH JEWELRY,

Patentees of Jeanne's Ear Wires,

No. 1 Maiden Lane, New York.

Designs furnished and estimates given.

KETCHAM & McDOUGALL,

No. 4 LIBERTY PLACE, NEW YORK.

MANUFACTURERS OF

Improved Gold and Silver

THIMBLES



AND THE PATENT

AUTOMATIC EYE GLASS HOLDER,

Which returns the Eye Glasses to their place on or under the lapel of the vest by simply casting them from the nose, combining all the conveniences of Cord, Hook and Case, without their annoyances.

J. B. LAURENCOT,

IMPORTER OF

WATCH GLASSES,

Optical and Fancy Goods

French Clocks, Musical Boxes, &c.

No. 33 MAIDEN LANE.

15 *Rue D'Enghien*, PARIS. *Box* 2954, *P. O.* NEW YORK.

F. WAASER,

IMPORTER OF WATCHES

WATCHMAKERS' & JEWELERS'

Tools & Materials

OF EVERY DESCRIPTION.

Also, DEALER IN JEWELRY, &c.

☞ Wheels Cut, Watches Jeweled and Repaired,

52 NASSAU STREET,

Cor. Maiden Lane, NEW YORK.

HELLER & BARDEL,

MANUFACTURERS OF

DIAMOND JEWELRY

AND DEALERS IN DIAMONDS,

13 John Street, New York.

SPECIALTY,

Diamonds, Mounted & Remounted.

JOSEPH B BOWDEN,

Manufacturing Jeweler,

Solid Gold Rings

A SPECIALTY

A Large Assortment of PLAIN, CARVED, PLAIN BAND & CHILDREN'S always on hand. Also

A Full Line of Cameo Sleeve Buttons.

Old No. 11 MAIDEN LANE, New York

VOSE & SOUTHWICK,

Manufacturers of Gold Jewelry



Sole Makers of the Separable Sleeve and Collar Buttons in Gold.

No. 183 Eddy Street, PROVIDENCE, R. I.

BOURQUIN BROTHERS,

Manufacturers and Importers of Watches,

All Kinds of



WATCHES Made To Order.

NO. 20 MAIDEN LANE, N. Y.

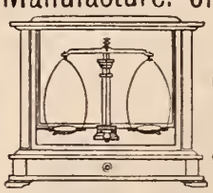
FACTORY, BIENNE, SWITZERLAND.

HENRY TROEMNER,

710 Market Street.

PHILADELPHIA.

Manufacturer of Fine Gold Scales,



DIAMOND SCALES,

☞ Bullion Balances and Weights, in use at all the U. S. Mints and Assay Offices.

PRICED CATALOGUE ON APPLICATION.

Solid Gold Rings---a Specialty

WM. H. ELY,

Solid Gold Rings

MANUFACTURER,

Viz., Plain, Chased, Engraved, Enameled, Engine Turned, Shield & Scale. *All qualities Warranted*

Orders Promptly Executed.

58 Nassau St., N. Y.

Knoeller, Schuetz & Gantter

MANUFACTURERS OF FINE

JEWELRY,

Diamond, Pearl and Cameo Mountings

A SPECIALTY.

No. 19 John Street, New York.

☞ Designs furnished and estimates made. Particular attention paid to remounting.

W. H. LUDEMAN,

Chronometer & Watch

MAKER,

Nos. 75 & 77 Nassau Street,

NEW YORK.

☞ Repairing of every Description for the Trade.

FINE WATCHES A SPECIALTY.

☞ Has constantly on hand a large variety of second hand Marine Chronometers, suitable for watchmaker's use

F. W. C. Nieberg,

Repairer and Adjuster of

FINE WATCHES,

and Marine Chronometers,

No. 8 JOHN STREET

New York.

F. JONES,

(Successor to Jones & Prince,)

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Sole Agent for Comins' Improved Amalgamators

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Jewelers' Work A Specialty.

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Fine Hair Jewelry

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No. 32 John Street, New York.

Pattern books constantly on hand for the Trade

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Fine Hair Jewelry,

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Solid Gold Mountings for Hair Jewelry, kept constantly on hand, and made to order at shortest notice. Orders from the country trade promptly attended to.

☞ **Coral and Black Onyx Goods**

SAMUEL LAWSON,

Manufacturing Jeweler,

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☞ Also make a specialty of

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H. M. RAYNOR,

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PLATINUM

FOR ALL

Laboratory & Manufacturing Purposes.

Native Platinum, Scrap, &c., purchased.

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Gold and Silver Watches,

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Gold and Silver Watch Cases made to order.

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GOLD PENS and PENCILS of all styles

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JEWELLERS' PIN VISE.



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The tool is made of Steel throughout, with the jaws and wearing parts hardened. Every part is made to guage. The finish is first-class and nickel-plated. Warranted to outwear at least three of the imported pin vises.

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LOWELL WRENCH CO., WORCESTER, Mass.

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Manufacturers and Importers of

MOROCCO, VELVET, SATIN

Jewelry and Silverware Cases,

Rosewood and Black Walnut Trays,

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THE JEWELER AND METALWORKER,

A fortnightly Journal for Watch and Clock-makers, Gold and Silversmiths, Electro-platers, Cutlers, Opticians, and all branches of the Precious Metal Trades.

WM. ALLEN, EDITOR, 108 Barnsbury Road, London, N., England.

Subscription, per annum, FOUR SHILLINGS STERLING,

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This Journal has a very large circulation among the above named and kindred trades in all parts of Great Britain and the Colonies and the U. S. of America and West Indies. A trial invariably proves its merits as an advertising medium. Terms for advertisements on application to the Editor.

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☞ Specimen copies on receipt of Five Cents.

Allgemeines Journal der Uhrmacherkunst.

Illustrirte Fachzeitschrift fur Uhrmacher.

Redacteur, Emil Schneider, Uhrmacher in Naumburg, Germany.

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The "Allgemeines Jonrnal der Uhrmacherkunst" bas taken upon itself the task of elevating the art of watch-making, and to protect and further the interests of the trade.

This Journal appears weekly, and, enjoying a great circulation all over the globe, is in a position to offer special advantages for advertisements.

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[Organ des Central Verbandes der Deutschen Uhrmacher]

Expedition: 43 Markgrafen Strasse, Berlin W., Germany.

Redacteur: R. STACKEL, Hof-Uhrmacher.

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Likenesses,

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At the Centennial International Exhibition.

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E. PAULUS, President
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Superior Watches,

☞ Great Reduction in Prices to meet the demands of the times.

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Trade Mark.

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Watch & Clock Oil



THE PORPOISE.

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Interchangeable Spectacles,

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EYE GLASSES.

Jewelers and others who keep spectacles for sale will please observe that, with these PATENT SPECTACLES, it is only NECESSARY to have a full *Complete Assortment of Lenses and Pebbles*, which being all of a UNIFORM SIZE, will FIT either the Gold, Silver, or Steel Frames, of which but a few of each kind are wanted; an advantage which will give a complete assortment of the finest Spectacles, for one-sixth the capital invested in a like assortment of the same quality goods of the old style frames.

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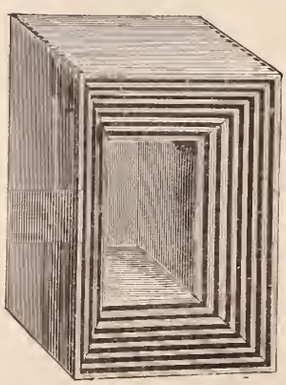
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And MAILING BOXES.



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J. SPENCER TAYLOR, Agent.

☞ Orders by mail, promptly attended to.

EIGHTEENTH ANNUAL STATEMENT

OF THE

WASHINGTON

Life Insurance Company,

155 BROADWAY, NEW YORK,

After May 1st in the COAL AND IRON EXCHANGE, Cor. Cortlandt & Church Sts.

CYRUS CURTISS, Pres't.

Net Assets December 31, 1876		$4,871,504 20
Receipts during the year:		
For Premiums	$983,839 16	
For Interest	296,439 11	1,280,278 27
		$6,151,782 47

DISBURSEMENTS.

Claims by Death	$325,441 63	
Matured End'ts and Return Premiums	82,554 25	
Surrendered Policies and Cash Dividends	453,353 66	
Annuities	1,455 48	
Total paid Policyholders	862,815 02	
Taxes	7,236 29	
Commuted Commissions	27,532 10	
Profit and Loss on Bounty Loan paid off, etc	2,435 28	
Dividends to Stockholders	9,548 22	
Expenses, Rent, Commissions, Salaries, Postage, Advertising, Medical Examinations, &c	169,639 40	1,079,206 31
Net Assets, December 31, 1877.		$5,072,576 16

ASSETS.

U. S. 6s and N. Y. City Stocks	$2,195,716 30	
Bonds and Mortgages	2,345,366 79	
Real Estate	227,551 15	
Cash on hand and in Banks	270,756 06	
Loans on Collaterals	15,408 24	
Agents' Balances	17,777 62	
		$5,072,576 16
Add excess of market value of stocks over cost		125,408 70
Interest accrued and due and unpaid		55,594 77
Deferred and unpaid Premiums	146,810 65	
Less 20 per cent	29,362 13	117,448 52
Gross assets Dec. 31, 1877		$5,371,028 15

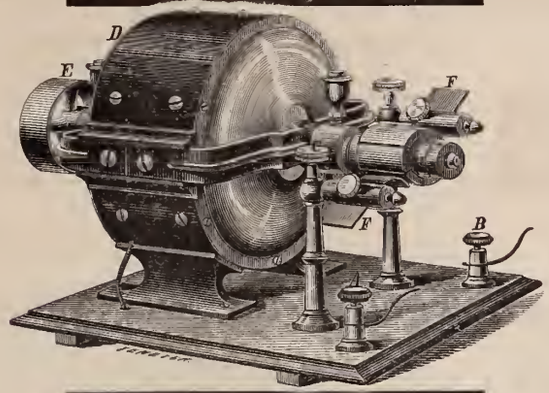
LIABILITIES.

Reserve by N. Y. standard official valuation	$4,395,143 00
Unsettled claims	32,729 48
Premiums paid in advance	8,910 97
Unpaid dividends to stockholders	78 75
Salaries, rent, &c	3,250 00
Total liabilities as to policyholders	4,440,112 20
Surplus as regards policyholders	930,915 95
Aggregate	$5,371,028 15
Capital stock	125,000 00

W. A. BREWER, Jr., Vice-President.
W. HAXTUN, Secretary.
CYRUS MUNN, Assistant Secretary.
E. S. FRENCH, Sup't of Agencies.
B. W. McCREADY, M. D., Med. Exam.

JNO. F. LUTHER.
79 NASSAU ST. N.Y.
MANUFACTURER OF FINE PRESENTATION JEWELS FOR ALL SECRET SOCIETIES. KNIGHT TEMPLAR'S CROSSES KEY STONE MARKS SOCIETY SCHOOL AND COLLEGE BADGES.

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CONDIT, HANSON & VAN WINKLE
Sole Agents NEWARK, N.J. U.S.A.

Machines for Electro-Plating, Electrotyping, Electric Light, Telegraphing, &c.

The Weston Dynamo-Electric Machine is constructed on an entirely new principle giving the greatest amount of electricity with the least consumption of power. Its simplicity and ease of management has already made it the standard machine The success attending its introduction has already had the effect of inducing parties building machines for similar uses to adopt some of the devices peculiar to our new construction. We beg to call attention to the various patents covering our machines, and to the fact that we guarantee purchasers against any infringement of existing patents, as well as to their adoption and endorsement by the largest manufacturers of the country, in many cases after a previous trial of all other machines.

THE MERIDEN BRITANNIA CO.,
WEST MERIDEN, CT., March 20, 1877.

MESSRS. CONDIT, HANSON & VAN WINKLE, Newark, N. J.

GENTLEMEN: You may send the two machines as proposed. I will say in regard to them they are splendid machines, and will say to any party you may refer to us that I shall advise them to take no other at any price, as yours is the best in my judgment, as we tried one, kept it, and took out all our old machines and replaced them with two of yours (making three 12 inch machines in all). Just say to your customers we refer you to the largest Plating Works in the world. Yours truly,
H. C. WILCOX, President Meriden Britannia Co.

In addition to the testimonials in our Catalogue of January 1, we beg to refer to the following houses: Carter, Howkins & Sloan; Enos Richardson & Co.; Bates & Bacon; Short, Nevney & Co. Stephen Richards & Co.; Meriden Britannia Co.; Russell & Erwin M'f'g Co.; Reed & Barton; Hall, Elton & Co.; Richardson, Boynton & Co.; Wm. H. Jackson & Co.; Stanley Works; Rogers Cutlery Co; Chas. Rogers Bros.; Edward Miller Co.; Mitchell, Vance & Co.; Norwalk Lock Co.; Hayden, Gere & Co.; Domestic Sewing Machine Co.; Eberhard Faber; Jos. Dixon Crucible Co.; Mumford & Hanson; Fagan & Son, and over 200 others. Outfits for NICKEL, SILVER, BRONZE PLATING, etc. The two highest Centennial Awards, and three of the Centennial Medals of American Institute.

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IMPORTER AND JOBBER OF

WATCHES,

DIAMONDS AND FINE JEWELRY,

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BEST CLASS OF ROLLED PLATE JEWELRY

—AND—

Key and Stem-Winding American Watches,

No. 513 BROADWAY, NEW YORK.

"Practical Hints on Watch Repairing."

BY "EXCELSIOR."

☞ *Will be sent to any address in the U. S. on receipt of*

Price, $3.50.

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French, Swiss, German & Sheffield Tools, Files,

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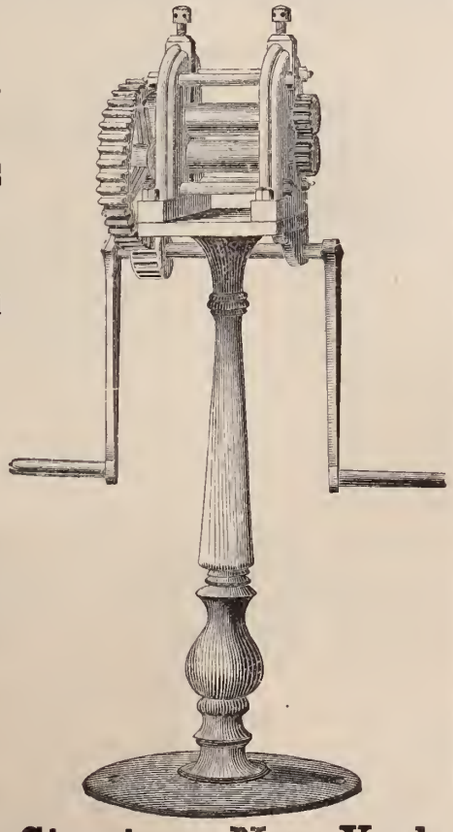
For Watchmakers, Jewelers, Engravers, Die-Sinkers, Machinist, &c.

Turning Lathes, Drills & Chucks

Rolling Mills, Draw Plates,

The Celebrated Rodenbush

Piercing Saws,



Horse Shoe Magnets,
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Engravers' Tools,
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Saltpetre,
Beeswax,
Rouge,
Tripoli,
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OWNERS AND MANUFACTURERS OF

Williams & Cook's Dust-Proof Watch Keys,

LEBANON, N. H.

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PRICE PER GROSS.

The Popular Name Key.

A. Nickel Plated Handle and Pipe, Swivel Top..... $10.75

English Pattern Key.

C. Nickel Plated Handle and Pipe, Swivel Top,..... ..... $7.50

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Our Key Pipes are all warranted to be made of the finest quality of steel, and are absolutely dust and moisture proof, constituting by far the best and cheapest key manufactured. Our sizes run from 1 to 10, 1 being the largest size, 4, 5 and 6 being the common sizes for American watches.

☞For Sale by the Trade generally.

N. B. We have lately made a decided improvement in the Key in fastening the pipe to the handle, as well as the finish generally.

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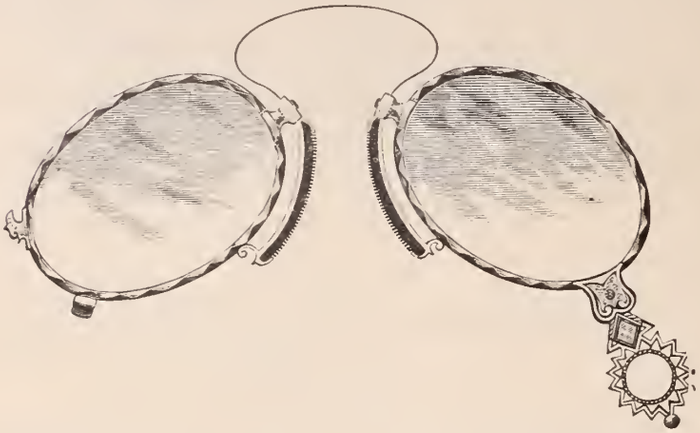
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Gold, Silver, Steel & Nickel-plated Spectacles,



Gold, Steel, Rubber, Celluloid and Shell Eye-Glasses,

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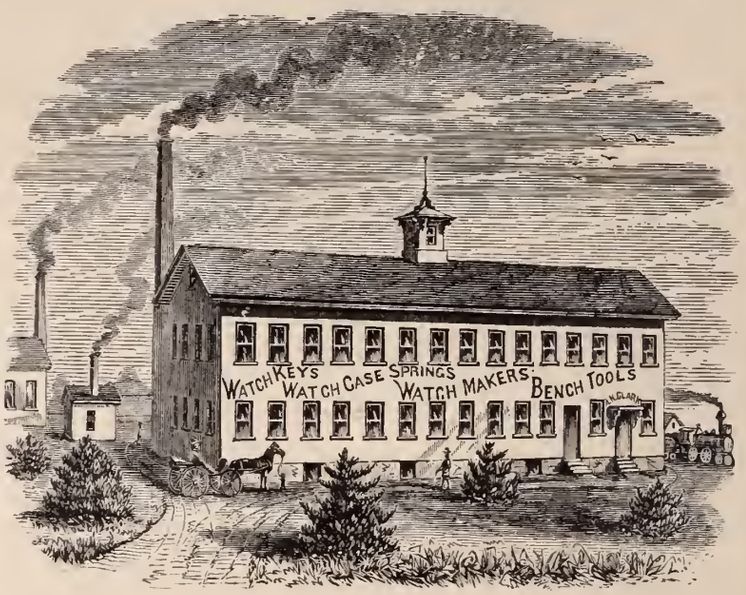
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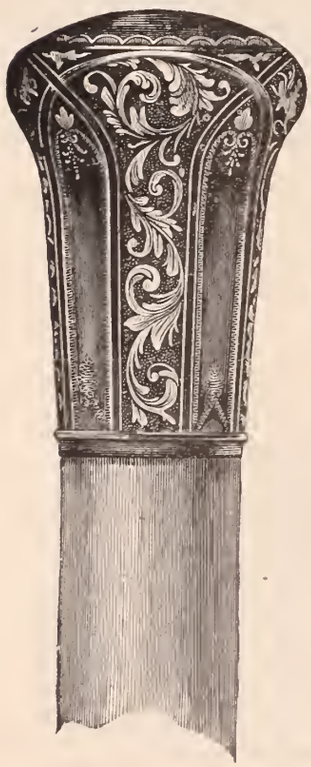
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CROSBY'S JEWELING TOOLS, &c.



☞ Sold by Jobbers in Watch Materials and Notions.

Small Articles in Metal manufactured to order.



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MANUFACTURER OF

Fine Gold & Silver-Headed

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AND

STERLING SILVERWARE,

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Manufacturers of GOLD & SILVER



Thimbles,



GOLD
SILVER,
STEEL,
RUBBER,
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EYE GLASS
Self Adjusting.

SPECTACLES AND EYE-GLASSES



OF ALL DESCRIPTIONS.

SOLID GOLD RINGS,

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Manufactory, Springfield, Mass.

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FOR SALE—A jewelry store in one of the best towns in the West (a good chance). State Normal School here. Railroad coming this season. Poor health the reason for selling. For particulars call or address Box 29, River Falls, Wisconsin.

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Caesar Brothers—Manufacturers of Enameled Clock Meter and Gauge Dials, Patent Door, Coffin and Pew Plates, Druggists' Labels, &c. No. 42 John Street, New York.

Gold, John T.—(Successor to the late T. Gold), Enamel Watch Dial Maker, 81 Nassau St.

Enamelers, Etc.

Nutt, J. D.—Enameler on Gold, Silver and Copper, 32 and 34 John St. Birds, Flowers, etc., Enameled in colors.

Orr, Jas. C.—Enameler on Fine Jewelry, Flowers, Birds, &c., Enameled in colors. Band Bracelets (a specialty). 77 Nassau Street.

Engravers and Die Sinkers

Fackner, Edward—Carver, Engraver and Chaser on Jewelry and Pencil Cases. Monograms Lettering, &c. 19 John Street.

Knapp, Charles—Engraver, Die Sinker & Manufacturer of Band Rings. 14 and 18 kt. Shanks and Heads for Rings, &c., 41 Maiden Lane.

Schuller, J. Dan'l—Stone Seal Engraver, Arms Crests, Initials and Monograms engraved on Stone Seals, &c. 71 Nassau street.

Electro Platers.

Jeandheur, F., & Son—Gold and Silver Electro Platers & Fire Gilders, Coloring Etruscan and Gold Jewelry specialty, 117 Fulton Street.

Fancy Goods, Clocks, Bronzes, Etc.

Hinrichs, C. F. A.—Importer and Dealer in French, English and German Fancy Goods, etc., etc. 29, 31 & 33 Park Place, N. Y.

Magnin, Ve J. Guedin & Co.—Importers of Clocks Bronzes, Musical Boxes & Rich Fancy Goods etc., 652 Broadway.

Le Boutillier & Co.—Importers of Fancy Goods, Clocks, Bronzes, &c. 3 Union Square.

Gold Chains, Etc.

Beck, J. & Son, Manufacturers of Fine Gold Chains and Chain Bracelets, 10 Liberty place, near Maiden lane, N. Y.

Dorrance, Edge & Co.—Manufacturers of the Celebrated Woven Fabric Gold Chain, No. 9 John street.

Hamiltons & Hunt.—Manufacturers of Fine Plated Chains and Patent Buckle Bracelets. Branch office, 176 Broadway. Factory, 226 Eddy street, Providence.

Nordt & Schlag.—Manufacturers of Chains and Fine Jewelry. No. 379 Broome street, N. Y.

Kaufmann Bros.—Manufacturers of Gold Chains, and Chain Bracelets, 26 John street; Factory, 331 and 333 Bowery, N. Y.

Saxton, Smith & Co.—Manufacturers of Fine Gold Chain. 194 Broadway.

Gold Pens, Etc.

Aikin, Lambert & Co.—Manufacturers of Choice Gold Pens, Cases, Holders, Toothpicks, etc., 12 Maiden Lane, N. Y.

Mabie, Todd & Bard—Manufacturers of Gold Pens, 180 Broadway.

Todd, Edward & Co.—Manufacturers of Gold Pens, Pencil Cases, Tooth Picks, &c., 652 Broadway, N. Y. Factory, Brooklyn.

Goldsmiths, &c.

Greene, Wm. C. & Co.—Goldsmiths; Manufacturers of Rich Sets in Taper Wire Coral. Office, 18 John street.

Gold Rings.

Bowden, Joseph B.—Manufacturing Jeweler.—Solid Gold Rings a specialty, 11 Maiden Lane.

Ely, W. H.—Manufacturer of Solid Gold Rings of every description. No. 58 Nassau Street.

Hair Jewelry.

Bernhard, A. & Co.,—Manufacturers of Fine Hair Jewelry and Device Work. The latest styles. 169 Broadway, Room 3, New York.

Menge, Chas. T.—Manufacturer of Fine Hair Jewelry and Device Work. No. 32 John St.

Schwencke O.—Manufacturer of Fine Hair Jewelry. Orders from the country promptly attended to. No. 43 Maiden Lane.

Jewelry Cases, Fancy Boxes, Etc

Braun, Chr. E.—Manufacturer of Jewelry Boxes, Trays for Show Cases, &c., 62 Chatham stt.

Dahlem, W.—Manufacturer of Cases for Jewelry and Silverware, No. 85 Nassau Street, N. Y Show Case Trays, &c., at the shortest notice

Wiggers & Froelick—No. 60 Nassau street.—Manufacturers of Cases for Jewelry, &c., of every description. Trays for Show-cases, Stands for Show-windows, etc. Jewelers' Traveling Cases, light, convenient and strong.

Jackson, Samuel C.—Manufacturer of Box and Trays, for Silverware, Watches, Jewelr &c. 180 Broadway, N. Y.

Lauten, E. A.—Manufacturer of Boxes for w-elers, Silverware Manufacturers, &c. . o. 63 Prince Street, N. Y.

Sturn, L—Manufacturer and Importer of C ses for Jewelry, Watches, Silverware, &c.No. 15 John street, N. Y.

N. Y. Fancy Leather Works, Manufacturers of Jewelry Cases, in Russia, Morocco, Velvet, Satin, Rosewood & Blackwalnut; Silverware Cases of every description. Geo. W. Spitzer, 33 Maiden Lane, N. Y.

Welch & Miller—Manufacturers of Morocco, Velvet, and Satin Jewelry Cases, Trays, &c. Complete stock on hand. 169 Broadway.

Jewelry—Fine.

Aikin, Lambert & Co.—Manufacturers. General stock of Reliable Jewelry, 12 Maiden Lauc.

Alford, C. G. & Co., Manufacturers. General line fine and reliable goods. Specialties in Onyx goods and chain. 183 Broadway, New York.

Andrews, J. F—Manufacturer of Fine Jewelry, Lockets, Sleeve Buttons and Rings in Stone Cameo, etc., a specialty. 35 Maiden Lane.

Baldwin, Sexton & Peterson,—Manufacturers Fine Jewelry. Whiting Building, Broadway and Fourth street.

Ball, W. H.—Manufacturing Jeweler. Fine Gold Bracelets a Specialty. No. 9 John St., N. Y.

Barthman & Straat—Manufacturers of Fine Jewelry. Seal and Stone Rings a Specialty Orders promptly attended to. 41 Maiden L

Bissinger, E. & Co.—Importers Fine Jewelry, Lockets, Crosses, Neck Chains, &c., No. 192 Broadway.

Brown, Thos. G.—Manufacturer of Rich Jewelry Necklaces, Lockets, Bracelets, Sleeve Buttons, etc., 9 Bond street, N. Y.

Brainerd, Steele & Co.—Manufacturers of Fine Jewelry and Braiuard's Patent Lockets. No. 9 Maiden Lane, New York.

Burch, DeMott & Coughlin.—Manufacturing Jewelers, 17 Maiden Lane, N. Y.

Carrow, Crothers & Co.—Manufacturers of Fine Jewelry, Roman Band Bracelets, Lockets, Crosses, &c. 12 John Street, N. Y.

Carter, Howkins & Sloan.—Manufacturing Jewelers, Whitiug Building, 4th St. & Broadway

Colby & Johnson.—Manufacturers of Fine Jewelry, and Importers of Watches. No. 17 Maiden Lane.

Chatellier & Spence,—Mauufacturing Jewelers. No. 652 Broadway, N. Y.

Coe, Plnueo & Stevens.--Manufacturers of Fine Jewelry, Fine Gold Lockets and Linen Finished White Enameled Goods a Specialty, No. 9 Maiden Lane, N. Y.

Chatterton & Dodd—Successors to Fitch & Chatterton, Manufacturers of Fine Gold Jewelry, Chains, Baud and Chain Bracelets, No. 19 John street, N. Y.

Demmert Bros. & Co.—Manufact'rs & Importers of Fine Jewelry, Cameo and Onyx Lockets, Sleeve Buttons and Sets a specialty. Old No. 9 Maiden Lane, New York.

Earle, M. A.,—Manufacturing Jeweler, Pearls, Cameos, and Diamond Mountings. No. 25 JohnStreet. Ralph D. Earle, Agt.

Field & Co.—Manufacturiug Jewelers, 8 Maiden Lane, N. Y.

Fitch, D. M. & Co.——Manufacturers of Fine Jewelry. Diamond and pearl mountings a specialty. No. 15 John street.

Frankel & Folkart,—Manufacturers of Seal, Cameo and Amethyst Rings, Ladies' and Gents' Lockets, Cameo Sets, &c. Also a full line of Diamond Settings, 192 Broadway, cor. John street, N. Y.

Geoffroy, A. R—Manufacturing Jeweler, 4 Courtlan l street, N.Y. Manufacturer of Geoffroy Patent Stone Lined Sleeve Buttons, Studs and Collar Buttons.

Goddard, John M.—Manufacturing Jeweler,—Seal Rings and Fine Lockcts a specialty, No. 25 Maiden Lane, N. Y.

Greason, Bogart & Pierce, succcssors to Arthur, Rumrill & Co., 182 Broadway, manufacturers of fine jewelry and gold chains

Howard, H. & Co.—Manufacturing Jewelers No. 14 John St., N. Y.

Hedges, A. J. & Co.—Manufacturing Jewelers 9 Maiden Lane.

Hartmann, P.—Manufacturer & Importer of Fine Gold, Diamond, and Filagree Silver Jewelry, No 36 Maiden Lane. P. O. Box 2,454.

Haskell, H. C.—Manufacturing Jeweler. Seal Rings a specialty. Special attention to Jobbing of every description. 12 John street.

Hunt & Owen.—Manufacturing Jewelers. Office, 5 Maiden Lane.

Hale & Mulford,—Manufacturers Rich Jewelry, Whiting Building, Broadway and 4th Street.

Jeanne Brothers.—Manufacturers of Diamond Mountings & Rich Jewelry. 1 Maiden Lane.

Kipper, Vogel & Co.—Manufacturers of Fine Jewelry. Etruscan Goods a specialty. No. 17 Maiden Lane.

Keller, Chas. & Co.—Manufacturing Jewelers Lockets a Specialty. No. 13 John St., N.Y.

Kuhn & Doerflinger—Manufacturers of Enamel'd and Roman Band Bracclets, also Fine Lockets and Pendants, 18John street.

Lennon, John D.—Manufacturing Jeweler, 142 Fulton street. Flat, and Half-round Gold Bracelets, Roman and Stone Lockets.

Moore & Horton.—11 Maiden Lane, Manufacturing Jewelers, Rings, Studs, Collar and Sleeve Buttons, Pins, Ear-rings, &c.

Mitchell, Noah.—Manufacturer of Fine Gold Jewelry, 694 and 696 Broadway, N. Y.

Miller Bros.—Manufacturers of Fiue Jewelry Lockets, Sleeve Buttons, Studs, etc., etc. 11 Maiden Lane, New York.

Mulford & Bonnet—Manufacturing Jewelers and Jobbers, 21 & 23 Maiden Lane, N. Y. Particular attention given to Jobbing and Special orders.

Maass, Cook & Groeschel—Manufacturers of Fine Jewelry and Lockets, 191 Broadway, (over Mercantile Bank,) N. Y.

Marx Kossuth & Co.—Manufacturing Jewelers. 39 Maiden Lane.

Owen, G. & S. & Co.—Manufacturing Jewelers. Office, No. 5 Maiden Lane.

Post & Speir, successors to Post, Beach & Decker Manufacturers of Fine Jewelry, Band Bracelets a specialty. 192 Broadway.

Riker, William—Manufacturer of Jewelry. Inlaid Gold Jewelry a Specialty. No. 5 Maiden Lane, N. Y.

Riley, J. A. & Co.—Manufacturing Jewelers, Etruscan Gold and Coral Sets, Roman Bracelets, Necklaces, etc. Onyx Goods a specialty. 7 and 9 Bond street, New York.

Richardson, Enos & Co.—Manufacturers of Fine Gold Jewelry, Gold Chains, Lockets, Crosses and Necklaces. Colored and Etruscan Work. No. 23 Maiden Lane, New York.

Richardson, J. W. & Co.—Manufacturers of Jewelry, Masonic and other emblems. 196 Broadway, Manufactory, Providence, R.I.

Sexton & Cole—Manufacturing Jewelers, Colored Gold and Onyx Goods a specialty. No. 61 Nassau street, N. Y.

Shoemaker & Co.—Manufacturing Jewelers, Cameo Buttons, and Lockets, Roman Gold Goods, etc. No. 21 Maiden Lane, N. Y.

Stites E.—(Late E. & D. H. Stites, and Saffen & Stites), Manufact'ring Jeweler, 12 Maiden Lane.

Sturdy Bros. & Co.—Manufacturers of Jewelry, No. 14 Maiden Lane, New York.

Spiess & Rosswog—Manufacturers of Fine Jewelry and Diamond Goods, Nos. 9 and 11 Maiden Lane, N. Y.

Thoma, Ernest—Manufacturer of Fine Jewelry. Sleeve Buttons, Rings, Ear-rings, &c. No. 173 Broadway, N. Y. Factory, Hackensack, N. J.

Vulcanite Jewelry Co.—Manufacturers of Whitby Jet and Vulcanite Jewelry, 191 Broadway, N. Y.

Wadsworth, E. E.,—Manufacturer of Rich Jewelry and fine Rolled Plate. Fine Seal Rings a specialty. 35 Maiden Lane.

Wilson & Brown—Successors to Dellere & Co. Manufacturers of Fine Jewelry, Enameled Goods a specialty. 113 Fulton street, opposite Dutch street.

Woglom & Miller—Manufacturing Jewelers, Nos. 32 & 34 John street, N. Y. Specialty, Black Onyx goods.

Jewelry—Rolled Plate, Celluloid, &c.

Celluloid Novelty Co.—Manufacturers of Imitation Coral Jewelry, 4 Maiden Lane.

Jewelry Glasses.

Brown, Edwin—Lapidary. Manufacturer of Glasses, for all kinds of Jewelry, Clocks, Chronometers, &c. Glasses bent to any shape. No. 85 Nassau st.

Jewelers' Boxes.

Swift Manufacturing Co.—Manufacturers of Jewelers Wood Nested and Mailing Boxes. No. 16 Cortlandt St

Dennison & Co.—Manufacturers of Jewelers' Findings, Paper Boxes, Cards, Tags, Cottons, Tissue Papers, &c., 198 Broadway, N. Y.

Frasse & Co.—Importers of Stubs, French, Swiss, German and Sheffield Tools, Files and Steel Wire for Watchmakers, Jewelers, etc., 62 Chatham street, N. Y.

Hammel, L. & Co.—Importers of Materials and Tools for Watchmakers, Jewelers and Engravers—also Optical Goods, &c., 9 Maiden Lane, N. Y.

Sudendorf, E.,—Importer of Superior Jewelers and Bracket Saws, quality warranted. Orders by mail promptly filled. No. 86 Nassau st.

Zimmern, Henry—Importer of Watch Materials, Tools, Glasses, Silk Guards, Silver & Plated Chains, Optical & Fancy Goods, 8 Maiden L

Lapidaries.

Kordmann & Michel—Lapidaries, dealers in Precious Stones. Rubies, Sapphires and Peridots cut. No. 53 Nassau St., N. Y.

Musical Boxes.

Paillard, M. J. & Co—Importers & Manufacturers of Musical Boxes, No. 680 Broadway, N. Y.

Opticians.

Burbank Manf'g Co.—Manufacturers of Spectacles and Eye Glasses of all descriptions, in gold, silver, etc., 14 Maiden Lane, N. Y.

Du Bois, Geo. W.—Successor to A. Landsberg, Importer and Manufacturer of Optical Goods 36 Maiden Lane, Box 3993, N. Y.

Hammel, L. & Co.—Importers of Spectacles, Opera and Marine Glasses, Telescopes, Microscopes, Optical & Fancy Goods, 9 Maiden L.

Laurencott, J. B.—Importer of Watch Glasses, Optical and Fancy Goods, Clocks, Bronzes, etc., 33 Maiden Lane, N. Y.

Lorsch, Albert—Manufacturer of the Patent Accommodating Spectacles and Eye Glasses in Gold, Silver and Steel, and other Optical Goods, 37 Maiden Lane, N. Y.

Spencer Optical Manufacturing Co.—Gold, Silver, Steel and Nickel Plated Spectacles, Eye Glasses, &c. 13 Maiden Lane, N. Y.

Sussfeld, Lorsch & Co.—Optical and Mathematical Instruments, Watchmakers' Tools, Materials, &c. 13 Maiden Lane, N. Y.

Suttie, Wm. J.—Manufacturer of Eye Glasses and Spectacles, in gold, silver, steel and shell, (Price List by mail), 39 Maiden Lane.

Precious Stones, &c.

Bissinger, Philip—Importer of Diamonds, Pearls and Precious Stones. Agent for the Bohemian Garnet Goods. No. 22 John St., N. Y.

Gruet, Jules.—Importer of Precious and Imitation Stones, Amethysts, Topazes, Cameos, Garnets, Doublets, Imitation Diamonds, Pastes, etc., No. 14 John street. Manufactory at Septmoncel, France.

Meyer, Francis Ed.—Successors to John B. Behrmann, Importer of Imitation Precious Stones, all sizes and shapes constantly on hand. No 38 Dey street, P.O. Box, 1981.

Rings and Shanks.

Bryant & Bentley..Manufacturing Jewelers, 350 Patterns Hard Solder Rings, 12 Maiden Lane

Knapp, C.—Manufacturer of Band Rings of 14 and 18karat, Gold Shanks & Heads for Rings. 41 Maiden Lane.

Silverware.

Gorham Manufacturing Co.—Union Square.

Whiting Manufacturing Co.—Manufacturers os Sterling Silverware, cor. Broadway & 4th st.

Wood & Hughes.—Manufacturers of Fine Silver ware. 14 John Street, N. Y.

The Adams & Shaw Co.—Manufacturers of Silverware. Cor. Broadway & 4th St., N. Y.

Silver Plated Ware.

Hall, Elton & Co.,—Manufacturers of the Finest Electro-Plated Ware, salesroom, 75 Chambers street, N. Y.

Holmes, Booth & Haydens—Manufacturers of Silver-plated Ware. 47 Chambers street.

The Adams & Shaw Co.,—Silversmiths, Whiting Building, cor. Broadway & 4th street, N. Y.

Meriden Britannia Co—Manufacturers of Silver plated Ware, 550 Broadway, N. Y.

Middletown Plate Co.—Manufacturers of Superior Electro-Plate. Factories, Middetown, Conn., Salesroom, 13 John Street

Manhattan Silver Plate Company.—Manufacturhrs of every description and quality of Silver Plated and Bronze Ware, office No. 39 John treet. Factory 382 to 390 2d Ave.

Rogers & Bro.—Manufacturers of the finest quality of Electro-Plated Ware. 690 Broadway.

Reed & Barton—Manufacturers of Fine Plated and Table Ware, of every description, 686 Broadway, N. Y.

Simpson, Hall, Miller & Co.—Manufacturers of Fine Silver Plated Ware, No. 676 Broadway,

Webster, E. G. & Bro.—Manufacturers of Fine Silver Plated Ware. Office and Warerooms, 14 Maiden Lane, N. Y.

Show Cases, Etc.

Kelly, P. J.—Manufacturer of all kinds of Show Cases, Counters and Refrigerators, No. 50 New Bowery, N. Y.

Kraft & Hoffmeister—Manufacturers of Metal Show Cases, Jewelry Trays always on hand, 8 & 13 North William street, N. Y.

Spectacle Case Manufacturers.

Koenen, A. & Bro. Manufacturers of Leather Spectacle & Eye Glass Cases, 81 Nassau St., N.Y

Thermometers Etc.

Tagliabue, Giuseppe—Thermometer, Barometer and Hydrometer Manufacturer, 302 Pearl street near Beekman, N. Y

Thimble Manufacturers.

Burbank Manuf'g Co.—Manufacturers of Gold & Silver Thimbles, 14 Maiden Lane, N. Y.

Ketcham & McDougall—Improved Gold and Silver Thimbles, Nos. 4 and 6 Liberty Place, near Maiden Lane, N. Y.

Walking Canes.

Fradley, J. F.—Manufacturer of Fine Gold and Silver-headed Walking Canes and Sterling Silverware. Office and Factory, No. 21 John street, N. Y.

Watch Companies.

American Watch Co.—Robbins & Appleton, No. 9 Bond street, N. Y.

Hampden Watch Co.—of Springfield, Mass. Office, No. 12 John St., New York.

Springfield Watch Co.—Factory, Springfield, Ill. Office, 11 Maiden Lane.

Tiffany & Co.—Makers of Fine and Complicated Watches. Office 14 John street, N. Y.

Watch and Chronometer Jeweler.

Queen, James—Watch and Chronometer Jeweler and Pallet Maker, 78 Nassau street, Room 8. Pivots inserted in Pinions, Balance, Staffs, &c.

Watch Importers, Etc.

Aikin, Lambert & Co.—Importers of Watches, Sole Agents for Paul Breton & Chas. Latour, Geneva. A general line of reliable Swiss Watches. Watch Cases of all styles made to order. 12 Maiden Lane, N. Y.

Bartens & Rice—Importers of Watches, Watch and Chrometer Makers. No 3 John street.

Beguelin, Tell A.—Importer of Watches, Watch Materials, Tools, etc. No. 71 Nassau St.

Bodine, G. M.—Importer and Dealer in Watches and Jewelery, etc., also Agent for Bard & Bros.', Gold Pens & Pencils, 22 Maiden Lane.

Bourquin Brothers—Importers of Watches from their own manufactory at Bienne, Switzerland, 20 Maiden Lane, N. Y.

Bynner, T. B.—Importer and Jobber of Watches, Diamonds and Fancy Goods, and dealer in the best class of Rolled Plate Jewelry. 513 Broadway.

Gagnebin, Chas.—Importer of all kinds of Watches, 64 Nassau Street. Agent for Ulysse Breting's Fine Chronomcters, Chronographs, Anchors, etc.

Cross & Beguelin—Importers of Watches, Watch Tools and Materials, dealers in American Watches, No. 21 Maiden Lane, N. Y.

Deraismes Brothers—(Successors to L. A. Lutz and Lutz Bros.) Manufacturers and Importers of Watches. Fine movements a specialty. 182 Broadway, N. Y. Factory in Locle.

DuBois, Francis & Co.—36 Maiden Lane, N. Y., Importers of Watches and Manufacturers of Watch Cases.

Droz, Henry E.—Importer of Watches and Watch Case manufacturer. Agent for the "E. Perregaux" Watch, and jobber in American Watches, No. 92 Fulton Street, N. Y.

Freund Max & Co.—Importers of Watches Jewelry and Precious Stones, 8 Maiden Lane

Ginnel, Henry—Importer of Watches, Tools and Materials. No. 31 Maiden Lane, N. Y. P. O. Box, 2967

Hyde's Sons, John E.—Wholesale Commission Agents only, for Jules Jurgensen, of Copenhagen, Ed. Perregaux, Locle, Monard Freres, Geneva, Watches, and of other makers of every quality. No. 22 Maiden Lane

Keller, L. H. & Co.—(Successors to G. A. Huguenin,) Importers of Fine Watch and French Clock Materials, No. 64 Nassau street, N. Y.

Kahn, L. & M.—Importers of Watches, No. 10 Maiden Lane, New York.

Mathez, F. H.—Importer of Watches. No. 5 Maiden Lane, N. Y.

Magnin, Ve J. Guedin & Co.—Importers and Agents of the Nardin Watch, No. 652 Broadway, N. Y.

Mathey, L. & A.—Importers of Fine Watches and Sole Agents for the **H. L. Matile's** Watches, No. 119 Fulton Street, N. Y.

May & Stern—Importers of Foreign Watches, Materials and Tools, etc. Manufacturing Jewelers. No. 20 John St., N. Y.

Nicoud & Howard,—Importers and Manufacturers of Watches, No. 14 John street, N. Y.

Oppenheimer Bros. & Veith, Dealers in Watches and Diamonds, and Manufacturing Jewelers. No. 35 Maiden Lane, N. Y.

Quinche & Krugler.—Agents for the Borel & Courvoisier Nickel Movements, 17 Maiden Lane, N. Y.

Robert, J. Eugene—No. 9 Bond street, New York Agent for Louis Audemar's celebrated watches.

Schwob, Adolphe—Manufacturer & Importer of Watches, 11 Maiden Lane, N. Y.

Saltzman & Co.—Manufacturers and Importers of Fine Swiss Watches, 15 Maiden Lane, (up stairs,) N. Y. Factory, Chau-de-Fonds, Switzerland.

Stein & Brother—Importers and Jobbers of Swiss and American Watches, Chains, Jewelry, &c. 767 Broadway.

Stern Brothers & Co.—Importers of Swiss Watches and wholesale dealers in American Watches, &c., No. 33 John Street, N. Y.

Scott, J. T. & Co.—Importers of Watches, and Manufacturers of Jewelry, and Jobbers of all grades American Watches. No. 11 Maiden Lane, N. Y.

Tiffany & Co.—Makers of Watches. General Agents for Patek, Phillippe & Co. Wholesale office, 14 John street, N. Y.

Waaser, F.—Importer of Watches, Materials, Tools, &c., Sole Agent for Ducommun's Main Springs, 52 Nassau street, N. Y.

Watch Cases.

Brown, J. A. & Co.—Manufacturers of The Ladd Patent Stiffened Gold Watch Cases, &c., 11 Maiden Lane, N. Y. Factory, 58 Eddy street, Providence, R. I.

Laurent, J.—Watch Case Manufacturer, Gold and Silver American Watch Cases constantly on hand. 17 John street, N. Y.

Watch and Chronometer Repairer.

Cerf, B.—Practical Watchmaker and Repairer, No. 10 John street, N. Y. Repairing and adjusting of Fine Watches done for the trade. All kinds of escape and stem winding wheels cut to order.

Ludeman, W. H.—Chronometer and Watchmaker. Repairing of every description for the Trade. 75 and 77 Nassau street, N. Y.

Sirois, A.—Practical Watchmaker, 75 and 77 Nassau street (Room 18), N. Y. Special attention paid to the repairing of Fine Watches. Pivots inserted.

Watch Case Repairers.

Tarbox, Hiram—Watch Case Repairing, Springing, Polishing and Engine Turning, 79 Nassau street, (room 22), N. Y.

Renaud, F.—Watch-Case Repairer.—Solid and Heavy Rolled Plate Bows and Pendents. Springer and Engine Turner of Cases and Jewelry, 36 Maiden Lane

Watch Guards.

American Silk Guard Manufacturing Co.,—Our goods are warranted all silk.—Kossuth Marx & Co. No. 39 Maiden Lane, N. Y.

Watch Glasses, Shades, Etc.

Hill, Robert S.—Manufacturer of Watch Glasses, &c, dealer in Imported Glasses, Flat Glasses a specialty; also, Jeweler's Glasses. Nos. 75 & 77 Nassau street, N. Y.

CINCINNATI.

Oskamp, Clemens.—Manufacturing Jeweler and Silversmith, Importer and Wholesale Dealer in Watches, Clocks, Materials, &c., 175 Vine street, Cincinnati, Ohio.

PHILADELPHIA

Booz & Thomas.—Manufacturers of Gold and Silver Watch Cases and Jewelry, 108 South 8th Street, Philadelphia.

Bennett, Jacob & Son,—Diamond Setters and Manufacturing Jewelers. 108 South 8th St., Philadelphia, Pa.

Conover David F. & Co.—American Watches, Wholesale Salesroom, southeast corner 7th and Chestnut streets, Philadelphia.

Hagstoz & Thorpe.—Manufacturers of Boss' Patent Stiffened Gold Watch Cases. Ledger Building. N. Y. Office, 13 John street.

Herold, Chas. P.—Successor to Hildebrandt, Herold & Co., Manufacturing Jeweler and Diamond Setter. Diamonds. 916 Chestnut St.

H. Muhr's Sons.—Manufacturing Jewelers, Solid Gold Rings a specialty, 158 North Second st.

Kolb, G. F. & Son.—Manufacturer of fine Morocco, velvet and Cabinet Cases for jewelry watches and Silverware. 722 Sansom street.

Krider, Peter L.—Manufacturer of Sterling Silver Ware, Artisan Hall, No. 618 Chestnut street

Liechty, D. & Co.—Manufacturers of gold and silver watch cases, and importers and dealers in Swiss and American watches, 402 Library street, Philadelphia.

Morgan & Headly.— Manufacturing Jewelers Cameo sets, Gold sets, Roman Lockets, Rings, Coral sets, and a general line of rich goods. 611 and 613 Sansom street, Philadelphia.

Pequignot, C. & A.—Manufacturers of Watch Cases, and dealers in American and Imported Watches. 22 S. Fifth street, Philadelphia.

Scherr, L. A. & Co. Wholesale Dealer in Watches Silver Plated Ware, Spectacles, Fancy Goods, Watch Materials, etc., 726 Chestnut street.

Simons, Brother & Co.—Manufacturers of Gold and Silver Headed Canes and Gold and Silver Thimbles. 611 & 613 Sansom St., Phila.

The Philadelphia Watch Co.—No. 618 Chestnut Street, Philadelphia. New York Agency, L. H. Keller & Co., 64 Nassau St.

CHICAGO.

American Watch Company, of Waltham, Mass. No. 170 State street, Chicago.

Charpier & Wathier.—Watchmakers and jewelers for the trade, and dealers in all kinds of watch materials. 61 West Kinzie street.

Dexter, W. W.—Watchmaker for the Trade Repairer of Fine Watches, Chronometers French Clocks, Music Boxes, &c. Room 32, Tribune Building, Chicago.

Purdy, J. H. & Co.—Jobbers of large and small Tools and Materials, for the use of Watchmakers, Jewelers, and kindred Trades. Spectacles—Jewelry Boxes, Plated Chains, &c., &c. No. 170 State street.

PROVIDENCE

Cooke, Daniel S. & Co.—Manufacturers of Solid Gold Initial Sleeve Buttons, Lockets, Cuff Pins, Rings, &c. 102 Orange Street.

Irons, Chas. F.—Manufacturer of Solid Gold Jewelry. Specialty Emblems, Pins and Charms Masonic, Odd Fellows, &c. 102 Friendship St.

Perkins, C. H.—Successor to Davis, Platt & Co., Manufacturer of Fine Gold Jewelry. Specialty, Ladies' Setts, Brooches and Earrings. No. 20 Conduit St., Providence, R. I.

Potter, Charles L.—Manufacturer of Pearl Shell Goods, Patent Spiral Studs a specialty, 407 Pine street, Providence, R. I.

NEWARK.

Condit, Hanson & Van Winkle.—Manufacturers of Machines for Electro-plating, &c.

Jones, F.— Gold and Silver Refiners, Assayers and Sweep Smelters Maple Place, Green street, Newark, N. J.

Krements & Co.—Manufacturing Jewelers, 361 Mulberry St. cor. Chestnut, Newark, N. J.

Lefort, Henry.—Stem-winding Watch Crown Manufacturers. 80 & 82 Marshall St.

Lelong, L. & Bro.—Gold and Silver Refiners, Assayers and Sweep Smelters, S. W. corner Halsey & Marshall streets, Newark, N. J.

Milne & Jourdan—Manufacturers of Stem-winding Watch Crowns Nos. 13 & 15 Franklin Ave., Newark, N. J.

Prince, David—Gold and Silver Refiner, Assayer and Sweep Smelter. Sole Agent for Comin's Improved Amalgamator. 63 Railroad Ave.

Van Houten, Sayre & Co.—Manufacturing Jewelers, 45 Franklin street, Newark, N. J.

Spring Announcement.

NEW YORK, MARCH 15, 1878.

REFERING to our notice in the February number of the CIRCULAR, we desire to call to your attention, the new designs of

Gold and Plated Jewelry,

shown on the following four pages. These illustrations are intended as supplementary to our Catalogue of last season, and they can be detached from the CIRCULAR, and placed with the Catalogue.

Every article is first photographed, then engraved; thus producing an absolutely correct illustration.

We have just issued a revised Price List; to be used in connection with our Catalogue, to take effect March 15th, in which we have made such *DECIDED REDUCTIONS* in our prices, as to make it to the positive advantage of dealers to order directly of us. We believe that eventually we can sell all of our goods without the employment of travelers, and if so, we shall strive to convince the trade that we can sell goods for smaller margins than houses who secure their trade almost wholly through traveling men.

By the use of our Catalogue, which surpasses anything of the kind ever produced in the Jewelry trade, in completeness, elegance, and reliability, dealers can order in small quantities, carry light stocks, and avoid accumulations of old goods. From time to time, we shall send out new designs, and buyers who avail themselves of this method, of making their purchases will be convinced of its practicability.

During the year 1878, our representatives, Mr. H. H. BRADLEY and Mr. W. W. MOORE, will go over their regular routes as usual with more complete and attractive stocks than ever before.

The prices for goods shown on the following pages, will appear in our revised Price List, which we shall mail to all who now have the Catalogue.

We shall adhere to our determination to send the Catalogue to the Jewelry trade only; notwithstanding we are constantly urged to send it to outside parties.

Applicants will therefore enclose their business card.

Very respectfully,

C. G. ALFORD & CO.,

NO. 183 BROADWAY, NEW YORK.


80

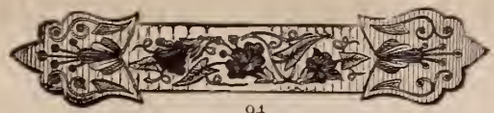

81


82


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92


93


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84


85

The above Rings and Pins are something entirely new. They are made of 14 carat Gold, polished, and the designs are inlaid with three different shades of gold, and may properly be termed as Mosaic Work in gold. The designs are set in, nearly the whole thickness of the Ring or Pin, and will last for all time. We have Buttons, Studs, Scarf Pins, &c., in the same class of work. These goods are patented, and will not be produced in cheaper quality.


437


861




128




435


375


429




469


266




137


110


836


440


300




425




6




1868


140




867

Examples of Novelties from our Spring Stock. Prices and description of goods shown on these four pages to be had upon application. When ordering any of these goods give Page Number as well as Number of Articles.

C. G. ALFORD & CO., 183 Broadway, New York.



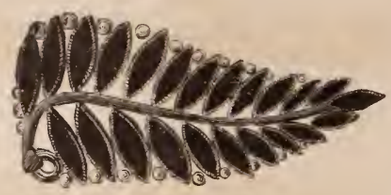
414



92



868



356



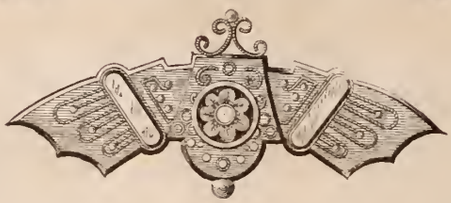
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3



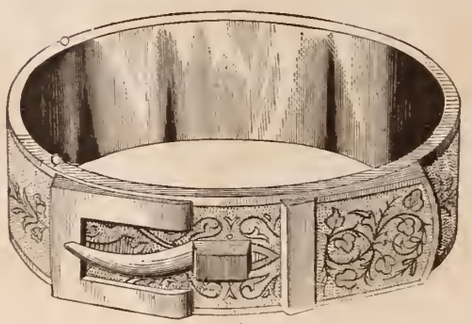
93



864



405



36



257



420



213



304



984



98



616



501

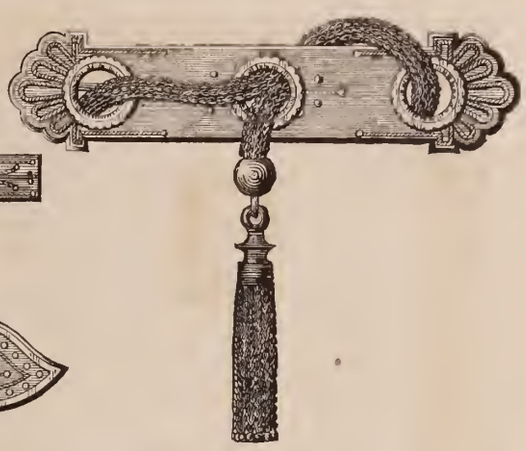
Our revised Price List is now ready. We have reduced our prices very much. Send for it, examine carefully, and be convinced.
C. G. ALFORD & CO., 183 Broadway, New York.


790


275


386


881


791


50


135


335


272

136

137

98


814


14


171

100


872

94


12

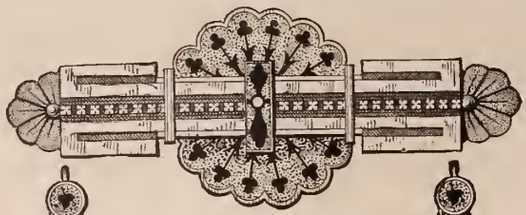

154


172

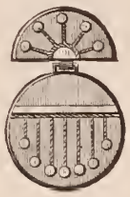
These new designs in Gold and Plated Jewelry, from our stock, are photographed from the articles themselves, then engraved, and are truthful representations.

C. G. ALFORD & CO., 183 Broadway, New York.


478


780


468


278





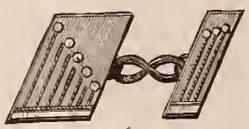

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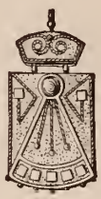





717




260


719






296


39




693


38


287




428




781




782



L. HAMMEL. LOUIS RUNKEL.

L. HAMMEL & CO.,

Importers of Watch Materials, Tools.

Watch Glasses, Silk Guards, Spectacles, Opera Glasses, Optical Goods, &c.

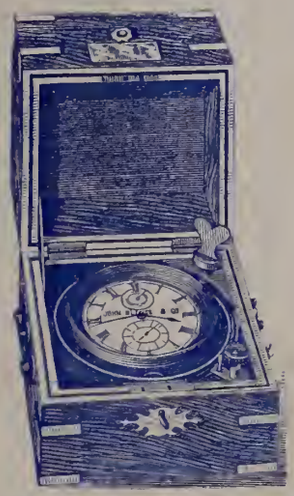
☞ Sole Agents in the United States for **G. B. Wheeler's Star Watch and Clock Oil,** and the Celebrated **Gravier Mainspring.**

☞ We would respectfully call the attention of the Trade to the celebrated **Star Spectacles and Eye Glasses,** of which we are the Sole Importers.

We would call the especial attention of the Trade to the celebrated PANTASCOPIC STAR SPECTACLES. they are the best made goods in this market! The frames of these Spectacles are light, finely tempered and highly finished, while the lenses are remarkable for their clearness, purity, and freedom from specks and flaws.

L. HAMMEL & CO., No. 9 Maiden Lane, New York.

☞ Send for Price List.



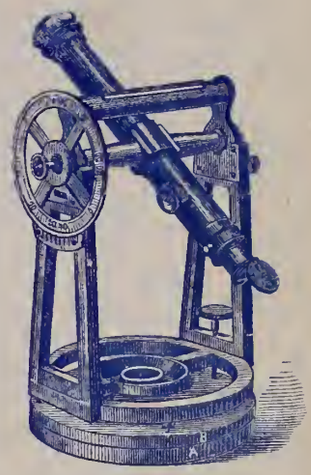
Standard Marine Chronometer
FOR KEEPING CORRECT TIME.

JOHN BLISS & CO.

STANDARD MARINE

Chronometers and Transits,

FOR WATCHMAKERS' USE.



No. 10

110 WALL STREET, NEW YORK.

IMPORTANT NOTICE.—These Transits are readily set in position without the aid of strictly correct time as a basis for that purpose. Printed instructions, easily understood, accompany each Instrument, and no calculations are required preliminary to setting in position.

As a trial only is required to insure unqualified approval, we are induced to make the following **LIBERAL OFFER**—On receipt by us of satisfactory reference, and 10 per cent. of the price, we will send one of the foregoing Transit Instruments, on hire or trial, for one month, with full printed instructions for setting up and using the same, and if purchased after trial, we will allow the whole hire to apply in part payment, and sell the Instrument on approved note at four months for the balance. Special terms for payment by installments, after trial, on application. We do not make this offer merely to hire these instruments, but to insure a trial with a view to sales, the hire received being only sufficient to cover the cost of repolishing in case they are returned. Send for Illustrated Circular giving full description.

JOHN BLISS & CO., 110 Wall Street, New York

E. Aug. Neresheimer,

IMPORTER OF DIAMONDS,

—AND—

Manufacturer of Fine DIAMOND JEWELRY,

No. 21 Maiden Lane,

NEW YORK.

HENRY MAY. Established 1854. JOSEPH STERN.

MAY & STERN,

IMPORTERS OF

Foreign Watches, Materials and Tools

AGENTS FOR THE SALE OF ALL

DOMESTIC MOVEMENTS AND CASES.

And MANUFACTURING JEWELERS

No. 20 John Street, New York.

☞ SOLID GOLD SEAL RINGS, in Cameo, Amethyst, Topaz and Onyx, A SPECIALTY.

L. LELONG & BROTHER,

GOLD & SILVER REFINERS,

Assayers and Sweep Smelters,

S. W. Cor. Halsey & Marshall Streets,

NEWARK, N. J.

SWEEPINGS A SPECIALTY.

CHAS. KELLER & CO.,

No. 18 John Street, New York.



Patented March 28th, 1876.

MANUFACTURE the above PATENTED LOCKET,

In plain gold, and with fine oxyd and cameo fronts, to hold 2, 4 and 6 pictures.

☞ FOR SALE BY THE BETTER CLASS OF JOBBERS. ☜



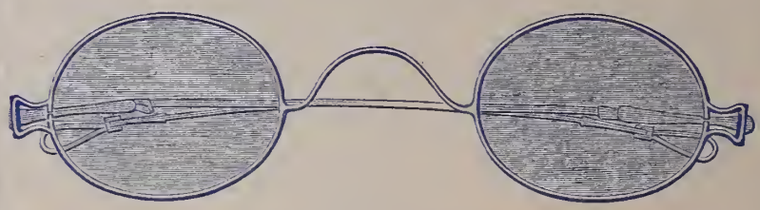
ALBERT LORSCH,

MANUFACTURER OF

PATENT ACCOMMODATING

Spectacles and Eye Glasses,

In Gold, Silver, Steel, &c.



Also Latest Novelties in Fine WATCHES & JEWELRY.

PRICES REDUCED TO SPECIE BASIS.

☞ I would call especial attention that with the above Spectacles and Eye Glasses it is only necessary to have one complete assortment of the different kinds of lenses, which being of uniform size, will interchange in all the different kinds of frames, thus giving a complete assortment for a comparatively small outlay

ALBERT LORSCH, 37 Maiden Lane, New York.

LORSCH BROS., 120 Sutter St., San Francisco, Cal.

L. & M. KAHN,

Importers of

WATCHES

Sole Agents for
James Kahn.
E. Bourquin & Fils
AND
Alphonse Matile
WATCHES.

112 Kearny St.
San Francisco,
CALIFORNIA.

5 Rue des Alpes,
Geneva,
SWITZERLAND.

No. 10 Maiden Lane, New York.

Manufacturers of the EAGLE TIMER ! *the Best in the market.*



FROM A DESIGN BY THE GORHAM COMPANY, ILLUSTRATIVE OF THE POEMS OF WILLIAM CULLEN BRYANT.

GORHAM MANUFACTURING COMPANY.

SALESROOMS, 1 BOND STREET, NEW YORK.

MANUFACTORY, PROVIDENCE, RHODE ISLAND.

EXCERPTS FROM EDITORIAL COMMENTS

UPON THE EXHIBIT OF

The Gorham Company, at the Centennial International Exhibition, at Philadelphia.

From the Providence Journal, April 20, 1876.

It has been the theory of the Gorham Company, that all articles within its sphere of manufacture, however commonplace or humble, could be made beautiful as well as useful, and it has aimed to advance American civilization by observing in all its work or product, that perfect harmony between purpose, proportion, and ornamentation, which satisfies at once the mind and the eye, and which, by combining the spirit of truth with the spirit of beauty, at once educates and refines. With this intent it has drawn to its aid whatever seemed best fitted for its purpose, and has in its employ artists and artisans whose taste and skill are to be judged by the specimens submitted to the public. Its processes of manufacture are largely the result of its own experience and the inventive skill in its employ, and are believed to be in a great degree peculiar to the silver worker of this country.

From the Boston Daily Advertiser, August 19, 1876.

THE GORHAM COMPANY. — If this name were not familiar to the civilized world, the authorized display at the Centennial would make it so. The Century Vase of solid silver, more than five feet in length, more than four feet in height, and weighing two thousand ounces, is prominent among the most noted of all things great and beautiful. Visitors gaze and admire, and wonder alike at the unexceptionable taste of the designer and the unexcelled execution of the maker. This costly silver ornament is so chaste and pure as to suggest the utter appropriateness of this metal for the purpose of embodying the wonderful conception. If made of gold, the vase illustrating the phases of the centuries would not be handsomer. . . . .

The self-contained nature of the Gorham Works is its peculiarity. Not only is each and every article that bears the mark of the Gorham Company made in their own factory, but nearly all the tools with which the silver is fashioned were invented by themselves for their especial use. . . . . All the artists associated in the production are in the service of the Gorham Company, and are the contrivers and finishers of their exquisite specimens of workmanship in silver ware. It is expressly to be borne in mind that the Gorham Manufacturing Company are silversmiths. Their business is the working of sterling silver. It is for their success in this regard that they are famous. . . . .

Beside and apart from this regular business, they have introduced that of electro-plating, and have made and are making the choice, heavily plated silverware so universally known as "The Gorham Ware." . . . . This, together with their production of the genuine solid silver goods of all desirable patterns of all manner of things useful and ornamental, is for sale by the principal dealers throughout the country.

From the New York Evening Post, October 24, 1876.

The advance made by American Silversmiths during the last ten years of the first century of the Republic is remarkable. It is not alone in such examples as the Century Vase exhibited by the Gorham Company, but in the display of articles of utility that the advance of what is called household art is best shown. . . . . The spectator's attention is drawn to the practical part of this company's display: the silver services of almost numberless designs, and the various other articles of use, whose beauty and elaboration in no way mar their utility. The art of Cellini and his followers is imitated and perfected to a wonderful degree by these modern artisans, and the display is one of which not only the exhibitors, but the entire country may be proud.

From the Daily Post, Birmingham, England, May 30, 1876.

Messrs. GORHAM & CO., of New York, are well known as manufacturers of silver and electro-plate, they having secured from Europe the services of artists of the first merit. Chief amongst their exhibit is a magnificent silver trophy, illustrative of the rise and progress of American civilization. The conception and realization of the piece are very fine. Other examples shown by this firm surprise one at the rapid advances the firm have made in art. Their shapes have all a peculiar lightness and elegance which are especially attractive. Water pitchers, jugs, ewers, and wine-coolers, in this country where ice is so much used, are naturally in large demand, and the firm seem to have reached the limit to which art can be applied in this direction. As compared with English manufacturers, this firm would not hold undivided sway. They, however, have a perfectly different style of finish, a different mode of executing the work, and they introduce entirely different feeling, consequently our own artists might profitably study the designs of this firm, and see how in a novel field success can be attained, whilst probably they might with advantage introduce some of the ideas into their own work.

GORHAM MFG COMPANY'S ILLUSTRATIVE LIST OF



The Raphael and Lady Washington are rich, massive soft and highly ornamented patterns.



The Cottage still retains its position among our standard patterns.

* Indicates patterns which we carry in Stock

PROVIDENCE, R. I.
1 BOND ST., N. Y.
February, 1877.

We submit to the Trade this selection from the great variety of our Spoon and Fork patterns, both in Sterling Silver and our fine quality of Electro-Plate.

In addition to the patterns illustrated are the "Grecian," "Palm," "Louis XIV.," "Threaded," "Plain Tipt," and "Queen."

Our lines of fancy pieces to match all our regular patterns are more varied and beautiful than heretofore, by reason of new styles of decorative ornament; in addition to which we are making an assortment of choice hand-wrought fancy pieces, appropriate for Bridal Presents, Table Decoration, etc., introducing beautiful effects of chromatic ornamentation, inlaying with niello enamel and delicate tints of color.

We are also producing a larger variety of lighter, less expensive work, especially adapted to the requirements of the Trade in the smaller cities and towns.

We would call special attention to the matter of varied weights in spoon work. The construction of a spoon governs, to a great extent, its desirable weight. The "Raphael," for instance, is necessarily a rich, heavy pattern. The "Lady Washington" admits of medium weight, and in design is of equal beauty. The "Swiss" and "New Tipt" are light and inexpensive.

SPOON AND FORK PATTERNS BY TEA SPOONS OF ACTUAL SIZE.



Swiss and New Tipt are made light, showy and very low in price, yet from their peculiar construction, substantial and durable.



The "Roman" and "Old English" are in Electro Plate. They have every appearance of solid Silver in design and softness of finish, and superior in quality to any Plated Spoons of American or foreign Manufacture.

The variety of combinations of spoon work suitable for wedding and holiday gifts ranges from two to upwards of three hundred pieces. Cases for these varied combinations are exclusively of our own manufacture, in which we introduce choice grades of leather, elegant textile fabrics, and various plain and ornamental woods; aiming to prove that substantial work may be made elegant and tasteful; when novelty has characterized the design of the silver the case has been in harmony with its contents.

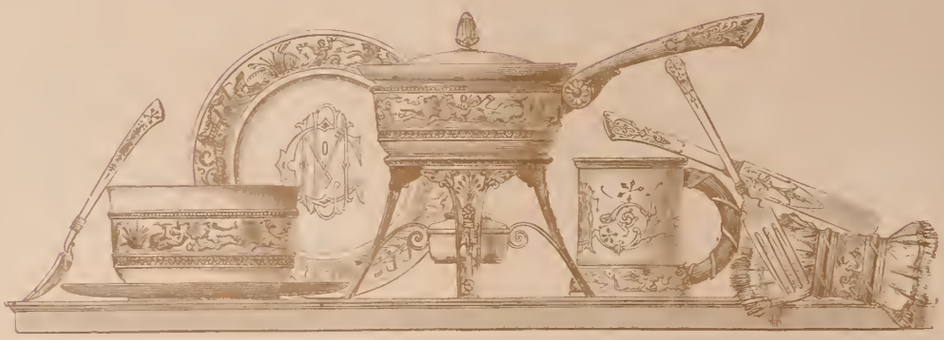
Into this branch of our manufacture we have recently introduced Plate Chests, substantially made in either plain or ornamental wood. The assortment of these chests included in our exhibit at the late Centennial International Exhibition proved an attractive feature of our exhibit, and obtained for us a special award in addition to medals awarded to us for silverware, The Century Vase, Repoussé Work, and Fine Electro-Plate.

Our variety of Hollow Ware, covering all the varied wants for table use and decoration, Prize Pieces, Presentation Sets, etc., is very complete, and may be seen at our salesrooms, 1 Bond Street, New York City. Photographs will be furnished on application. Drawings and estimates for special presentation pieces will be submitted.

All our Silver Ware is of sterling purity, $\frac{925}{1000}$ fine, and is stamped with our trade-mark, — STERLING

Our Electro-Ware is superior in finish, plate, and durability, and is steadily growing in public favor. It bears the stamp of our trade-mark, — GORHAM MFG. CO.

GORHAM M'F'G CO.



GORHAM MANUFACTURING COMPANY.

SALESROOMS, 1 BOND STREET, NEW YORK.
MANUFACTORY, PROVIDENCE, R. I.

MANUFACTURERS OF

SILVER WARE in all its branches, exclusively of Sterling purity, $\frac{925}{1000}$ fine.

FINEST QUALITY ELECTRO-PLATE, known as "The Gorham Ware."

CASES made from morocco and choice grades of leather and textile fabrics and various plain and ornamental woods, for Silver Ware, Jewelry, Toilet Articles, etc.

PLATE CHESTS, for Services of Plate, of substantial make, in plain and ornamental wood.



Awards to the Gorham Company by the Judges of the Centennial International Exhibition.

Award for Sterling Silver Ware.
Award for the Century Vase.
Award for Repoussé Work.
Award for Fine Plated Ware.
Award for Plate Chests.

THE RIVERS DE PRESS, CAMBRIDGE, MASS

Volume IX. No. 3.

APRIL, 1878



D. E. HOPKINSON, PUBLISHER.

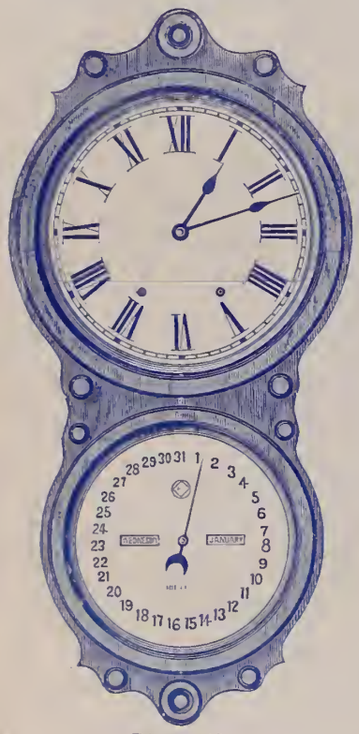
42 NASSAU STREET, NEW YORK.

American Clock Co.

581 BROADWAY, NEW YORK.

No. 172 State Street, Chicago. No. 7 Montgomery St., San Francisco.

Office Calendar.



No. 6.

SOLE AGENTS IN AMERICA FOR:

E. N. Welch M'f'g Co. **New Haven Clock Co.**

Seth Thomas Clock Co. **Welch, Spring & Co.**

Seth Thomas' Sons & Co.

A. S. Hotchkiss' Tower Clocks,

(Made by the Seth Thomas Clock Co.)

A NEW

Seth Thomas Calendar Clock.

Eight-day Spring Time; Eight-day Spring Strike.

12 Inch Time Dial. 10 Inch Calendar Dial. Hight, 32 Inches.

TO THE TRADE.

Gentlemen: Our Illustrated Catalogue for 1878, of Seth Thomas, New Haven, E. N. Welch, and Welch, Spring & Co. Clocks will be ready about March 20th.

We shall mail a copy to each of our customers, and if any of them fail to receive it by April 1st, they will please ask us for it.

Copies will be furnished the Trade upon application. Very truly,

AMERICAN CLOCK COMPANY,

HINE & THOMAS.

F. KROEBER,

No. 8 CORTLANDT STREET, NEW YORK.

MANUFACTURER AND DEALER IN EVERY DESCRIPTION OF

AMERICAN CLOCKS.

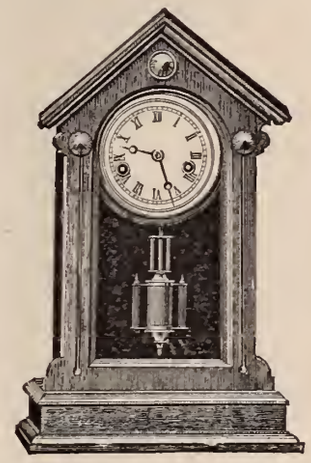
WALNUT CLOCKS OF A SUPERIOR GRADE A SPECIALTY.



"BATAVIA."—Walnut.
8-Day Strike; Height, 20 inches.
List Price, $11.00.



"ONWARD."—Walnut.
1 Day Strike; Height, 14 inches.
List Price, $4.50.



"RESCUE."—Walnut.
1-Day Strike; Height, 15 inches.
List Price, $4.50.



"OTTAWA."—Walnut.
8-Day Strike; Height, 22 inches.
List Price, $11 00.

ESTABLISHED 1857.

Waterbury Clock Comp'y

MANUFACTURERS OF AND DEALERS IN EVERY DESCRIPTION OF

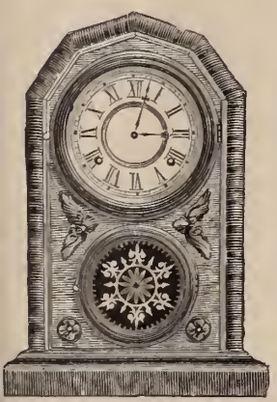
AMERICAN CLOCKS,

4 CORTLANDT ST., NEW YORK,

197 State St, CHICAGO.

31 & 33 Sutter St., SAN FRANCISCO.

MANUFACTORY, WATERBURY, CONN,



"CARDINAL."

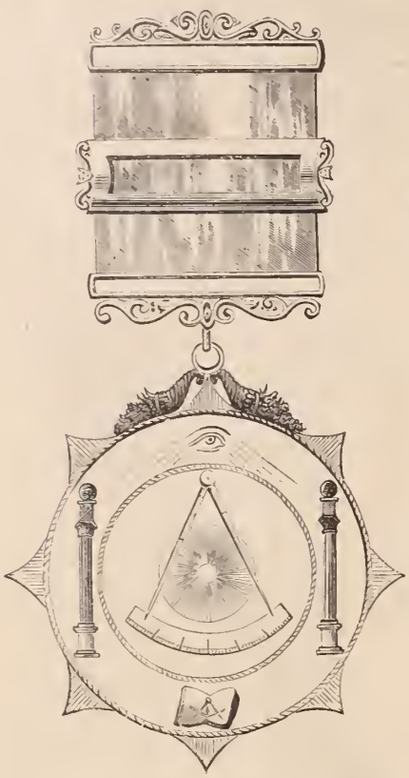


"FLORENCE V.P."

M. BAILEY, Treasurer.

SOLE AGENTS FOR THE ITHACA CALENDAR CLOCK COMPANY.

Illustrated Catalogues and Price Lists furnished to the Trade upon application



EDWARD WILLIAMS,

MANUFACTURER OF

Fine Jewels & Diamond Work,

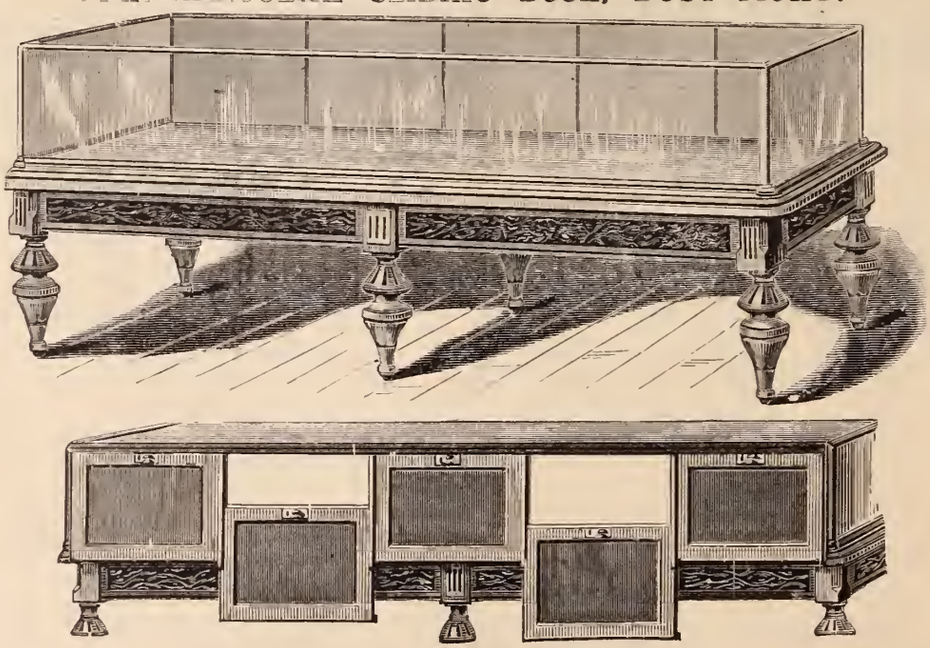
No. 196 Broadway, New York.

All work made by Mr. Williams can be returned at his expense, if not performed strictly according to order, and the amount paid refunded. Having done the work for the Supreme Council of 33d°. ▭ for the past seventeen years, he gives as reference from that Hon'ble body (of the Nor.·. Mas.·. Jur.·. ▭) such names as Chas. T. McClenachan, John W. Symons, Gen. Albert C. Pike and others of So.·. Mas.·. Jur.·.

☞ **Mr. Williams will furnish any known Badge or Jewel of any Nation or Society in the World. ALL WORK DONE ON THE PREMISES.**

PATENT IMPROVEMENT IN COUNTER SHOW CASES,

PERPENDICULAR SLIDING DOOR, DUST-TIGHT.



REAR VIEW OF CASE SHOWING SLIDING DOOR.

Its advantages are as follows:—The doors are more conveniently opened and closed, less liable to get out of repair or broken, articles are more easily reached in wide cases, mirrors are more safe, it dispenses with hinges, economizes room, excludes dust, and is air tight *when closed.*

☞ Drawings furnished and estimates given for fitting stores in cabinet work complete.

REFERENCES:—Gorham Mf'g Co., Rogers & Bro., Mitchell, Vance & Co. Meriden Britannia Co., M. S. Smith & Co., Detroit, Mich. D. Valentine, Syracuse, N. Y.

B. & W. B. SMITH,

220 West 29th Street, New York.

Ansonia Clock Company,

MANUFACTURERS OF AMERICAN CLOCKS,

And IMPORTERS of CLOCKS of EVERY DESCRIPTION.

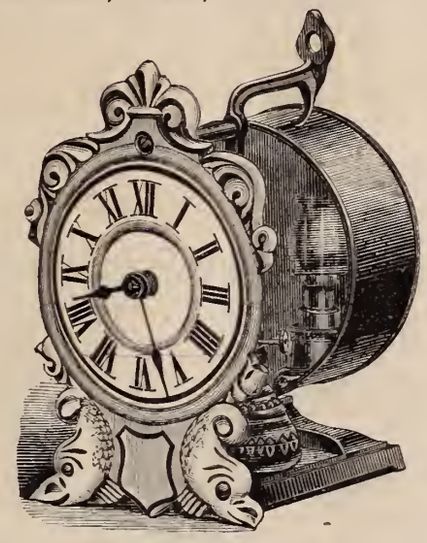
SALESROOMS: 19 & 21 CLIFF STREET, and 5 CORTLANDT STREET, (Near Broadway) **NEW YORK.**

FACTORIES ANSONIA, CONN., and 10th STREET, NEW YORK.



Peep O'Day Alarm.

One-half the size: Stem-Winding: Sets the alarm and winds at the back. "Only requires one spring" to be wound, and will go in any position.



Illuminated Night Light Clock.

For either Gas or Oil Lamp; will go in any position; Stem-winding.

Patented January 17th, 1878.



Alert Alarm,

One-half the size.

BELL INSIDE OF CASE; STEM-WINDING.

Sets the alarm and hands at the back.

"Only requires one spring to be wound," and will go in any position.

The above are excellent Time-keepers. Illustrations and prices on application.

A NEW LINE OF NOVELTIES WILL SHORTLY BE OFFERED.

LOUIS STRASBURGER & CO.,

Importers and Makers of Watches,

OF EVERY DESCRIPTION,

From the Finest Stem-Winding and Setting Goods to the Lowest Priced Watch in the Market.

OUR STOCK is unusually complete and attractive and embraces an assortment of the best COMMERCIAL WATCHES to be found anywhere ranging from $4.00 to $600 each.

We would also call the attention of buyers to our select display of fine TIMING and COMPLICATED WATCHES, CHRONOGRAPHS and REPEATERS, of every description, from the establishments of the most eminent makers.

☞ We are also the Sole Agents for the INTERNATIONAL WATCH CO.'s WATCH, so well and favorably known in this market.

LOUIS STRASBURGER & CO.,

NO. 15 MAIDEN LANE, NEW YORK.

Diamond Bureau,
No. 30 Boulevard Houseman,
PARIS.

WATCH FACTORY,
CHAUX DE FONDS, SWITZERLAND.

The Meriden Britannia Company,

UNION SQUARE, NEW YORK,

ARE MANUFACTURING AND HAVE ON EXHIBITION A CHOICE SELECTION OF DESIRABLE ARTICLES IN

FINE SILVER-PLATED WARE,

Combining every Modern Improvement in Plating and Elegance of Design, with Sterling Quality, and offer to the Trade the most Extensive and Attractive Assortment ever presented in this country. Also, a Large Variety of ORNAMENTAL ARTICLES, suitable for Presents. Our Assortment consists in part of

Spoons, Forks, Table Cutlery, Dinner, Tea and Dessert Sets, Entre Dishes, Epergnes, Castors, Cake Baskets, Ice-Water Sets, Tea and Coffee Urns, Salvers, Communion Ware, &c.



We take much pleasure in referring to the reputation we have for many years maintained for manufacturing SPOONS AND FORKS BEARING THE TRADE MARK, "1847, ROGERS BROS."

Particular attention is invited to our Patented Process of Electro-Plating Spoons and Forks, by which the parts most exposed to wear receive an EXTRA COAT OF SILVER. This feature renders these goods more economical and durable than those of any other manufacture, while the increased cost is relatively small. This method of plating we apply to the 4, 8 and 12 oz. plate, as required.

THE PORCELAIN-LINED ICE-PITCHERS, ANOTHER SPECIALTY.—Valued for retaining the Purity and Coolness of Water, as well as for Durability, Cleanliness and Chemical Excellence of their Interior Surface. The Porcelain is Enameled on Hard Metal and cannot be broken or cracked by rough usage.

"There are many apparent advantages in these linings, besides those already mentioned, BUT THE ABSENCE OF ANY INJURIOUS MATERIAL in the construction of this inner chamber SHOULD BE THE FIRST CONSIDERATION IN SELECTING A SAFE ICE PITCHER FOR DAILY USE."—S. DANA HAYES, M. D., State Assayer of Massachusetts.

Centennial Medals and Diplomas were Awarded to this Company for "Superior" Silver-Plated Ware.

Extract from Centennial Judges' Report.—"Their large variety of Silver-Plated White Metal Hollow Ware is of excellent quality and finish, and of tasteful designs."

"Their Silver-Plated Forks, Spoons and Knives are of superior quality and excellent finish. Their XII Plating, or extra plating on exposed parts, deserves commendation."

Extract from American Institute Report.—"Their Porcelain-Lined, Double-Walled Ice Pitchers are **A 1**, and possess ALL the qualities the company claim."

"We consider the goods made by this company to be by far THE BEST made in this country, and we believe in the world."

☞ **First Premiums** Awarded at all Fairs where Exhibited, from the World's Fair, 1853, to American Institute Fairs, 1873, 1874 and 1875, inclusive, and at the Philadelphia Centennial Exhibition, 1876.

Manufactories, West Meriden, Conn. **WAREROOMS, UNION SQUARE, NEW YORK.**

SUPERIOR ELECTRO-PLATE!

MANUFACTURED BY

THE MIDDLETOWN PLATE COMP'Y,

Factories, MIDDLETOWN, Conn.

Salesrooms, { 13 John Street, New York.
120 Sutter Street, San Francisco.

SUPERIOR HARD WHITE METAL,

SUPERIOR HEAVY PLATE,

SUPERIOR DESIGNS, WORKS OF ART.

Wedding and Fancy Presentation Pieces in Elegant Designs.

Our assortment of Tea Sets, Urns, Butter Dishes, Syrup Cups, Baskets, Pitchers, Waiters, Goblets, Fruit and Berry Dishes is complete in new designs.

Our Patterns are Original! **Photographs sent dealers on application!**

SIMPSON, HALL, MILLER & CO.

Fine Electro-Silver Plated Ware,

Factories, Wallingford, Conn. Salesroom, No. 676 Broadway, N. Y.

One of the oldest and most reliable manufactories in the country.

Our Solid Table Ware is made of the Best Nickel Silver.

Spoons, Forks, Ladles, Pie Knives, &c.

IN GREAT VARIETY OF PATTERNS.

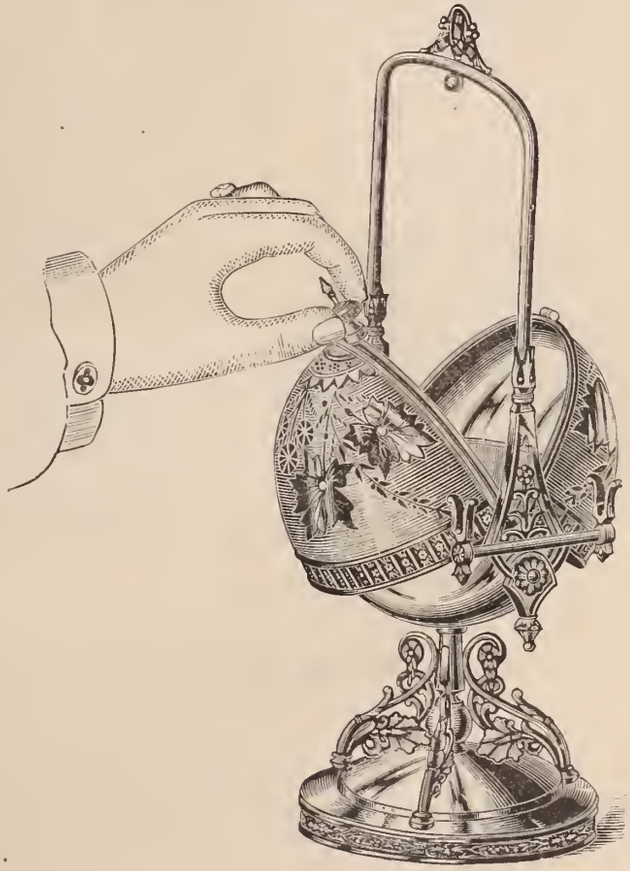
Solid Steel Knives, superior article and Heavily Plated for Service.

OUR HOLLOW WARE consists of Tea Sets, Urns, Tea Trays, Spoon Holders, Milk and Water Pitchers, Butter Dishes with glass plates, Cake Baskets, Biscuit Bowls, Berry Dishes, Fruit Stands, Pickle and Jelly Dishes, Dinner and Breakfast Castors, Oyster and Soup Tureens, Baking Dishes, Steak Dishes, Vegetable Dishes, Celery and Salad Dishes, Syrup Cups, Tray and Rack for holding Spoons and Forks, also with Call Bell attached (patented). Toilet Sets in great variety of patterns, beautiful glass, richly mounted with silver, Vases, Card Stands combined. The glass Vases are of various patterns and styles; cut and fancy, of the most beautiful designs and mounted in the most elegant silver frames and stands. Centre Pieces and Epergnes, the most elaborate or plain, as desired; in fact thousands of articles in the line of Silverware, and all warranted to be first-class and exactly as represented.

☞ Our facilities being second to none to produce the finest and most serviceable *ELECTRO-PLATED WARE*, at the lowest possible price. By years of experience, close attention to business, and our unsurpassed facilities, we are enabled to produce goods as cheap, if not cheaper, than any other concern in this country, consequently dealers can feel assured that they will always get goods from us at the very lowest price. The pride of our house is to make the finest goods, and sell them at fair prices, and please our customers, by honorable dealings, and retain the reputation which, we believe, is unquestioned as to our making the best of goods and also the cheapest.

PATENT BUTTER DISH.

The annexed cut represents an entirely new and novel Butter Dish. The convenience of its opening and closing can but strike one favorably. Its beauty of design and workmanship must please everybody. We have produced other valuable designs and patents in the way of Butter Dishes as well as many other useful articles in our line, but this is the most complete and perfect in its arrangement of anything heretofore produced, and must take the lead of all other first-class Butter Dishes in the market.



DAVID F. CONOVER & CO.,

(Successors to Wm. B. Warne & Co.)

Importers, Manufacturers and Wholesale Dealers in

WATCHES AND JEWELRY.

Silver and Silver-Plated Ware,

American Watch Wholesale Salesroom,

Southeast Corner Chestnut and 7th Sts.,

(FIRST FLOOR.)

David F. Conover,
B. Frank Williams,
C. Edgar Righter.

PHILADELPHIA, PA.

JAS. BOSS' PATENT STIFFENED



Gold Watch Cases

ARE MADE TO FIT ALL GRADES OF

American Movements.

The Manufacturers call the special attention of the Trade to their unequalled facilities for promptly filling orders for Cases for odd Movements, and the

New Model Waltham Wtches.



HAGSTOZ & THORPE,

PHILADELPHIA, PA.

New York Office, 13 John Street.

GORHAM MANUFACTURING CO.

SILVERSMITHS,

NEW YORK AND PROVIDENCE.

Manufacturers of Sterling Silverwares of the highest character and in all branches of the art. Also makers and sole Proprietors of the GORHAM PLATED WARES, so well and favorably known to all dealers. In Silver Goods our stock is unusually complete and attractive, embracing an extensive assortment of Silver Hollow Ware, of exquisite design and finish, comprising large single pieces for presentation purposes, and complete services in Tea, Dinner and Dessert Ware, etc., and from which we can supply *immediately* any demand by *mail* or *telegraph*.

Dealers availing themselves of these advantages are enabled to offer customers a select display of goods, which often results in large sales. We would call attention to our lithographic circular on another page of this Journal, containing two of our latest designs in Spoons and Forks. Each of these patterns has artistic merits that especially recommend them to the best class of trade.

ILLUSTRATED CIRCULARS, showing our complete line of Spoon Patterns, together with price and weight list, will be sent to the Trade *only*, upon application. We are now making the largest line of successful patterns of spoons and forks on the market, and our business in these goods, for the past season, has exceeded that of any previous year. All Solid Silver Goods of our manufacture are GUARANTEED absolutely to be of the English Standard, $\frac{925}{1000}$ fine.

GORHAM PLATED WARE.

This well known ware has been on this market for thirteen years, and has won an abiding reputation as the Standard ware of this City. These goods are made of Hard Metal, *Silver Soldered throughout*, and very heavily plated, and is a durable and elegant substitute for Solid Silver. Our object is to produce the *BEST ARTICLE* made in Plated Ware, the cost of production being a secondary consideration. We are enabled to make considerable reductions from former prices. We offer these Wares to the Trade as the most durable and economical Plated Ware made.

Photographs and Prices Furnished.

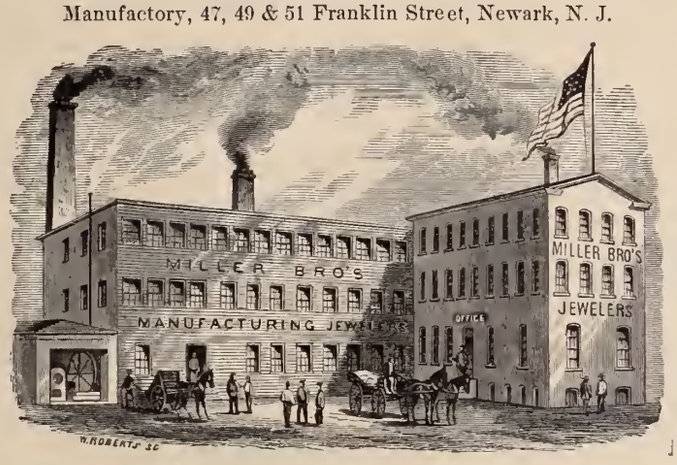
MILLER BRO'S,

MANUFACTURING JEWELERS,

No. 11 MAIDEN LANE, NEW YORK.

Manufactory, 47, 49 & 51 Franklin Street, Newark, N. J.

INITIAL GOODS



A SPECIALTY!

Seals, Lockets, Sets, Sleeve Buttons, Studs, Collar and Chemise Buttons.

ATTENTION IS INVITED TO OUR

NEW STYLES OF ETRUSCAN SLEEVE BUTTONS,

MOUNTED WITH

RUSTIC LETTERS,

BIRDS, ANIMAL HEADS AND FANCY ORNAMENTATIONS.

Sussfeld, Lorsch & Co.,

IMPORTERS OF

Optical and Mathematical Instruments,

Watchmakers' Tools, Materials, Watch Glasses, &c.

No. 13 Maiden Lane, New York.

Sole Depot in the United States for
BARDOU & SON'S
Universal Opera Glasses,
U. S. ARMY & NAVY SIGNAL GLASSES,
&c., &c.

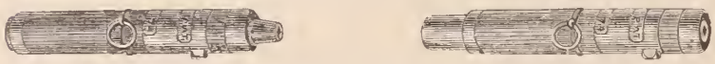
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TRADE MARK

Sole Depot in the United States for the
CELEBRATED
Crown Spectacles and Eye Glasses,
OF ALL GRADES.

TRADE MARK

Commission Merchants at 27 Rue de Paradis, Poissonniere, Paris.

NORCROSS PATENT DUST-PROOF KEY.



KEY OPEN. Patented July 14th, 1874. KEY CLOSED.

This Key is preferred to all others, as there is no possibility of dust accumulating in the pipe. It will not break or wear like other Keys, being made of Stub's steel, hardened and tempered.

CLEMENS OSKAMP,

Manufacturing Jeweler,

And SILVERSMITH,

IMPORTER & WHOLESALE DEALER IN WATCHES,

CLOCKS, MATERIALS & OPTICAL GOODS.

No. 175 Vine Street,

CINCINNATI.

NOAH MITCHELL,

MANUFACTURER OF

Fine Gold Jewelry

CAMEO SETS, ONYX GOODS,

Medallions, Studs, Sleeve Buttons, Rings and Diamond Settings of all Kinds.

DIAMOND SETTING A SPECIALTY.

694 & 696 Broadway, cor 4th St., New York

(WHITING SILVER MF'G CO.'S BUILDING.)

ALL ORDERS PROMPTLY ATTENDED TO.

J. B. & S. M. KNOWLES,

MANUFACTURERS OF

Sterling Silverware

Office, No. 20 MAIDEN LANE,

NEW YORK.

Factory, No. 95 PINE STREET, PROVIDENCE, R. I.

Greason, Bogart & Pierce,

Successors to Arthur, Rumrill & Co.

MANUFACTURERS OF GOLD CHAINS,

AND

FINE ETRUSCAN JEWELRY,

Nos. 182 and 184 BROADWAY,

New York.

AMASA BRAINERD, JOHN W. STEELE, DYER BRAINERD

BRAINERD, STEELE & CO.,

MANUFACTURERS OF

Brainerd's Pat. Lockets,



(Patented June 17, 1874.)

These Lockets combine both beauty and strength. They are made of solid 14kt. gold, and the stones used are the finest obtainable in the market. They cost no more than those of the old style, if indeed as much; and the combination of secrecy and durability renders them much more desirable. We make three sizes in four different shapes—round, oval, cushion and oblong square; and also Sleeve Buttons of the same style, containing a concealed box for miniatures, a novelty new to the Trade.



FINE GOLD JEWELRY,

No. 9 Maiden Lane,

NEW YORK.

ESTABLISHED 1837.

VICTOR BISHOP & CO.,

IMPORTERS OF

Diamonds, Precious Stones, Mosaics, Cameos

CORAL JEWELRY,

Imitation Stones, Roman Pearls.

FINE FRENCH BEADS,

Of all Colors, in Strings and Necklaces.

Diamond Scales, Gold Shells, Silver and Copper Foil, &c.

Enamel of all colors and quality; also Platinum and Copper.

No. 47 NASSAU STREET, NEW YORK.

House in Paris, 66 Boulevard de Sebastopol.

SAXTON, SMITH & CO.

MANUFACTURERS OF

Fine Gold Chain.

No. 194 BROADWAY,

New York.

Factory, No. 183 Eddy Street, Providence, R. I.

☞ **Sole Agents for the new PATENTED CHAIN BAR, containing a Detachable Pencil.**

BUCKENHAM, COLE & HALL,

IMPORTERS OF

Diamonds, Pearls

AND OTHER PRECIOUS STONES,

MANUFACTURERS OF FINE JEWELRY,

10 Maiden Lane, New York.

☞A large stock of FINE DIAMONDS, Mounted and Unmounted kept constantly on hand. Goods sent on approval to any part of the country on receipt of satisfactory references.

ESTABLISHED 1847.

J. T. SCOTT & CO.

Importers of Watches,

MANUFACTURERS OF JEWELRY,

—AND—

Jobbers in all grades of American Movements,

GOLD AND SILVER CASES.

Gold Chains, Jewelry, Diamonds, Clocks, Silverware, &c.

No. 11 Maiden Lane, New York.

☞Prompt and careful attention given to filling orders for all kinds of goods pertaining to the trade. Goods sent on approval when satisfactory references are furnished.

☞ Designs and estimates given, and special attention paid to orders from jewelers for Watches, Badges, etc., desired for presentations

☞Price List of American Watches, &c., sent only to regularly established dealers.

WOOD & HUGHES,

STERLING

Silverware Manufacturers

No. 16 JOHN STREET,

NEW YORK.

Geo. Krementz. J. A. Lebkuecher.

KREMENTZ & CO.,

Manufacturing Jewelers,

No. 361 Mulberry Street,

Corner Chestnut, NEWARK, N. J.

TRADE  MARK.

WHITING M'F'G COMPANY,
STERLING
SILVERSMITHS,
WORKS & WAREROOMS,
Broadway & Fourth St., New York.
WHOLESALE ONLY.

SMITH, HEDGES & CO.
IMPORTERS OF
DIAMONDS
Which are offered to the Trade, mounted or unmounted.
No. 1 Maiden Lane, cor. Broadway,
NEW YORK.

CARTER, HOWKINS & SLOAN,
Makers of
FINE JEWELRY,
Consisting of Chains, Bracelets, Sets, Pins, Studs, Sleeve Buttons, Rings, &c., in Roman, Etruscan and Enamel.
Whiting Building, Corner Broadway and Fourth Street,
A. CARTER JR.
WM. HOWKINS,
A. K. SLOAN.
NEW YORK.
C. E. HASTINGS,
GEO. R. HOWE,
W. T. CARTER.

Established 1817.
Ve. J. MAGNIN, GUÉDIN & CO.
Manufacturers and Importers,
FINE SWISS WATCHES,
REPEATERS, CHRONOGRAPHS & CALENDARS.
GENEVA GOLD JEWELRY,
FRENCH CLOCKS AND BRONZES,
RICH FANCY GOODS,
HORSE-TIMERS & PODOMETERS,
GOLD AND SILVER CHATELAINE WATCHES.
No. 652 BROADWAY, NEW YORK.
Sole Agents for the James Nardin Watch.
House in Geneva, 14 Grand Quai.

HALE & MULFORD,
MANUFACTURERS OF
RICH JEWELRY,
(WHITING BUILDING),
No. 694 Broadway, corner 4th Street,
NEW YORK.
Stone and Stone Cameo Goods, Rings, Necklaces, Colored and Etruscan Work, Etc.
FIRST-CLASS GOODS OF OUR OWN MAKE
EXCLUSIVELY!

BALDWIN, SEXTON & PETERSON
MANUFACTURERS OF
Fine Jewelry,
Diamond and Stone Cameo Goods,
GOLD CHAINS, &c.
Importers of Diamonds, Pearls, Emeralds, Rubies, &c.
WHITING BUILDING,
Cor. Broadway and Fourth Street,
NEW YORK.

THE

Adams & Shaw Company,

SILVERSMITHS,

694 BROADWAY, · · · · NEW YORK.

THE ADAMS & SHAW COMPANY have prepared expressly for the current wedding season a fresh and brilliant line of Sterling Silver Ware.

THE ADAMS & SHAW COMPANY manufacture for the trade exclusively and decline to sell at retail.

THE ADAMS & SHAW COMPANY will stamp the name of their customers upon goods and cases, whenever practicable to do so.

THE ADAMS & SHAW COMPANY ask especial attention to their Spoon and Fork patterns, which are conceded to be the most successful in the market.

THE ADAMS & SHAW COMPANY are prepared to furnish designs and estimates for Testimonials, both public and private, military and long-range rifle matches, Race Cups, etc., etc., upon application. They have for this purpose a rich variety of decorative patterns and designs, accumulated through twenty years manufacturing of fashionable testimonials, affording special advantages to customers in point of beauty and economy.

THE ADAMS & SHAW COMPANY also make the very finest Hard Metal, Silver-Soldered Plated Ware in special designs. They were the first to discard entirely the use of soft solder in soldering the joints, mounts, etc., and no such weak spot or defect can be found in any piece of ware ever made by them. They received the highest award, Medal and Diploma, at the Centennial Exhibition for Hard Metal, Silver-Soldered Electro Plate.

WHEELER, PARSONS & HAYES,

MANUFACTURERS OF

Watch Cases, Gold Chains & Fine Jewelry,

AND DEALERS IN

AMERICAN AND SWISS WATCHES,

NO. 2 MAIDEN LANE, NEW YORK.

ENOS RICHARDSON & CO.

MANUFACTURERS OF

FINE GOLD JEWELRY,

Gold Chains, Lockets, Crosses and Necklaces,

COLORED AND ETRUSCAN WORK.

All Goods sold strictly of our own manufacture.

23 MAIDEN LANE, NEW YORK.

ENOS RICHARDSON, L. P. BROWN, F. H. RICHARDSON,
THOS. SLATER, W. P. MELCHER.

ONYX GOODS A SPECIALTY!

JOHN A. RILEY & CO.,

Manufacturing Jewelers,

ETRUSCAN GOLD AND CORAL SETS, ROMAN BRACELETS,
NECKLACES, &C.

Nos. 7 and 9 BOND STREET

NEW YORK.

No. 126 Kearny Street, San Francisco, Cal.

Established 1813.

THOMAS G. BROWN,

MANUFACTURER OF

FINE JEWELRY,

NEWARK, N. J.

—AND—

9 BOND STREET, NEW YORK.

DENNIS M. FITCH, (Of late firms, Fitch & Chatterton, Merrill, Fitch & Allin.)
SAM'L L. HOWLAND. CHAS. S. FITCH.

D. M. FITCH & CO.,

MANUFACTURERS OF

FINE JEWELRY,

NO. 15 JOHN STREET,

NEW YORK.

DESIGNS FURNISHED AND ESTIMATES GIVEN.
Special attention paid to orders for Badges, Medals, &c.
Diamond and Pearl Mountings a Specialty.

POST & SPEIR,

MANUFACTURERS OF

FINE JEWELRY.

SPECIALTIES:

Band Bracelets,
Stone Cameo Goods,
And Seal Rings.

No. 192 BROADWAY,

NEW YORK.

CARROW, CROTHERS & CO.,

MANUFACTURERS OF

FINE JEWELRY,

No. 12 John Street, New York.

Specialties!

FINE LINKED SLEEVE BUTTONS, ROMAN BAND BRACELETS, LOCKETS & CROSSES.

N. B.—We desire to call the attention of the Trade to our IMPROVED BRACELET CATCH, and our new styles of Link Sleeve Buttons.

Established 1846.

WILLIAM RIKER,

No. 5 Maiden Lane, New York.

Factory, 42 Court Street, Newark N. J.

CHATELLIER & SPENCE,

Manufacturing Jewelers,

652 BROADWAY, NEW YORK.

No. 1129 Chestnut Street, PHILADELPHIA, PA.

No. 12 West Street, BOSTON, MASS.

No. 120 Sutter Street, SAN FRANCISCO, CAL.

Chatterton & Dodd,

(Successors to Fitch & Chatterton).



Manufacturers of Fine Gold Jewelry,

No. 19 JOHN STREET,

GEORGE W. CHATTERTON.
DAVID DODD.

NEW YORK.

COE, PINNEO & STEVENS,

MANUFACTURERS OF

LOCKETS,

WHITE ENAMEL STUDS & BUTTONS,

Linen Finished and

FINE JEWELRY,

Old No. 9 Maiden Lane, New York.

ESTABLISHED 1859.

RINGS A SPECIALTY.

BRYANT & BENTLEY,

No. 12 Maiden Lane, New York.

MANUFACTURE A LARGE VARIETY OF

FINE SOLID RINGS,

For Ladies and Gentlemen, in CAMEO, AMETHYST, ONYX, TOPAZ, TURQUOISE, GARNET and other stones, Fine CAMEO, CORAL and ROMAN SETS of new and handsome designs. LOCKETS, MEDALLIONS, SHAWL and SCARF PINS, SLEEVE BUTTONS, STUDS, &c. All goods warranted.

☞ We continue to manufacture several hundred patterns of **HARD SOLDER RINGS**, in every style, for men, women and children, stamped and warranted 16 carat fine.

J. EUGENE ROBERT,

IMPORTER OF WATCHES, No. 9 Bond Street, New York.

Sole Agent for { LONGINES WATCH COMPANY. "AGASSIZ" LADIES' STEM-WINDERS. Louis Audemars' Fine and Complicated Watches.

LONGINES NICKEL METAL STEM-WINDERS of various sizes and styles, pronounced unsurpassed for quality, durability and price.

Extract from M. Favre Perret's Report to Federal Council of Switzerland on Centennial Exhibits.

The LONGINES WATCH Co., merits a special mention. It was the first to properly estimate the importance and put in execution the system of manufacturing watches *altogether* by machinery, thereby obtaining regularity and steadiness of work. By adopting all latest improvements and with its complete stock of tools, we are convinced that they will produce a most thorough timepiece, faultless in solidity and construction, and the parts of which will in reality be interchangeable. In Switzerland this establishment is the Pioneer factory of entirely machine-made watches. Its reputation, well earned, has spread not only in the United States, but also in all the principal commercial centers of the globe."

Will Remove May 1st to 30 Maiden Lane.

HENRY GINNEL,

Importer of Swiss Watches,

TOOLS AND MATERIALS, SILK GUARDS, &c.

And Jobber in all grades of American Watches.

No. 31 MAIDEN LANE,

P. O. Box 2967. NEW YORK.

In addition to our line of **SWISS KEY AND STEM-WINDING WATCHES, and Materials of all kinds,** we have a large stock of the celebrated **PIONEER Stem-Winding and Stem-Setting Watches** (manufactured expressly for us) and pronounced by competent workmen to be the best watch for the money in the market. They are cased in silver and German silver hunting or opened faced. **Send for Prices.**

Full Trade Discounts on American Watches.

E. J. DERAISMES. H. A. DERAISMES.

DERAISMES BROTHERS,

Successors to L. A. LUTZ & LUTZ BROTHERS,

MANUFACTURERS AND IMPORTERS OF THE

LUTZ BROTHERS, L. A. LUTZ, PERRET & CO., And A. HUGUENIN-NARDIN

WATCHES.

Fine Movements a SPECIALTY. ¼ seconds, Chronographs and Extra Fine Silver Watches always in Stock. Goods sent on approval, satisfactory N.Y. City references being furnished.

No. 182 BROADWAY,

P. O. 2639, NEW YORK.

FACTORY, Rue des Envers, Locle, Switzerland.

MATHEZ

Watch Company,

OF NEW YORK.

Gents' and Ladies' Stem-Winding Movements

STRAIGHT LINE, 3-4 PLATE NICKEL.

These Movements are of six different grades, uniform in size and beautifully finished, and will be SOLD AT LOWER PRICES than any other goods of similar excellence.

☞A FULL LINE of materials for our movements always kept in stock for the convenience of those using our goods.

F. H. MATHEZ, Sole Agent,

No. 5 Maiden Lane, New York.

Van Houten, Sayre & Co.,

Manufacturers of Fine Jewelry,

FACETED GOODS,

Office & Factory, 53 Chestnut Street,

NEWARK, N. J.

ESTABLISHED 1845.

SALTZMAN & CO.

MANUFACTURERS AND IMPORTERS OF

Fine Swiss Watches



SOLE IMPORTERS OF THE

AUGUSTE SALTZMAN
VICTOR VUILLAUME
ALBERT VUILLE
} Watches

SPECIAL NOTICE.

The Trade is respectfully notified to beware of imitations of the name of Saltzman, marked on Watches of an inferior grade, and purporting to be the genuine Saltzman.

No. 15 Maiden Lane, New York.

J. A. BROWN & CO.

OFFICE AND SALEROOM: No. 11 Maiden Lane, N. Y.
FACTORY: No. 104 Eddy St., Providence. R. I.

SOLE MANUFACTURERS OF THE

Ladd Patent Stiffened Gold Watch Cases



For the Movements of the various American Watch Co.'s, in full and three-quarter plate, Gent's, Ladies' and Boys' sizes, Key and Stem-Winders, and in the following styles. BASCINE, FLAT-BEVEL and MANSARD, (this latter as originally named, modeled and introduced by them) forming the most complete and varied line of elegant Cases ever offered for sale. It is now ten years since these Watch Cases were introduced to the public, during which period of time they have steadily gained in popular confidence and esteem. Made of thick plates of Gold and Nickel Composition, thoroughly welded together and rolled to the required thickness—they are, while equally handsome—stronger and more durable than the finest Solid Gold Cases of the same thickness of metal, and at ONE-THIRD or ONE-HALF the COST, and with good movements, they make the cheapest, most elegant and serviceable Watches in the market. The critical examination of these goods by the trade and public is invited with entire confidence that the verdict of approval of their merits will be unanimous now, as ever before.

FOR SALE BY JEWELERS GENERALLY.

☞Dealers can obtain them of the Wholesale Watch and Jewelry Houses, or their Traveling Agents, throughout the United States and British Provinces.

☞All genuine Watch Cases of our manufacture, have "G. W. Ladd's Patent, June 11th, 1867," stamped upon the side band underneath the glass bezel.

Refuse all others. Send for full Descriptive Circular.

NATHAN E. MORGAN. CHAS. B. HEADLY.

MORGAN & HEADLY,

MANUFACTURERS OF

GOLD SPECTACLES,

FINE JEWELRY, CHAINS, BRACELETS,

18 Karat Plain Rings, &c.

Artisan Hall, 611 & 613 Sansom Street,

PHILADELPHIA.

☞A full line of *DIAMONDS,* mounted and unmounted, always on hand, which we will send on approval to the Trade, on receipt of reference.

BOREL & COURVOISIER TO THE FRONT!

SWISS WATCHES

AGAIN RANK AS THE BEST.

IMPROVED MACHINERY HAS DONE THE WORK.

☞We are happy to inform our agents and patrons that the **new B. & C.** are now ready. ALL ORDERS CAN BE FILLED AT ONCE! We are authorized to make a considerable reduction from former prices, in order to place them within the reach of all.

☞**Dealers wishing to act as authorized agents for the sale of these celebrated Watches and Movements will be furnished with full particulars by addressing, with business card,**

QUINCHE & KRUGLER,

No. 17 MAIDEN LANE, NEW YORK.

Sole Agents in the United States.

DENNISON & CO.,

MANUFACTURERS OF

Paper Boxes, Jewelry Cards, Tags,

PINK AND WHITE COTTON,

TISSUE PAPERS, JEWELERS' AND PLATE BRUSHES, SEALING WAX, RUBBER BANDS, &C. SEND FOR CATALOGUE.

Sole Propietors of Millers' Specialties!

JEWELRY CASKETS, SILVER WHITE CASKETS, and

SILVER WHITE, the best article for Cleaning Silver and Plated Ware. Samples furnished the Trade for distribution.

DENNISON & CO.,

Boston, New York, Philadelphia, Chicago, Cincinnati, St. Louis.

LOUIS A. SCHERR. CHAS. H. O'BRYON. G. W. SCHERR.

LOUIS A. SCHERR & CO.

Importers and Wholesale Dealers in

Watches, Jewelry,

WATCH MATERIALS, TOOLS, GLASSES, &C.

Spectacles, Silk Guards, &c.

Wholesale Agents for American Watches.

No. 726 CHESTNUT STREET,

FIRST FLOOR,

PHILADELPHIA.

Dorrance, Edge & Co.

MANUFACTURERS OF

THE CELEBRATED WOVEN FABRIC

GOLD CHAIN.

Elegantly Mounted Bracelets, Opera, Leontine,

VICTORIA WATCH GUARDS & NECKLACES, in all the Newest Designs.

☞Our stock is unusually complete, and, in addition to the above, a variety of Necklaces, from 1½ to 40 dwt. each, to which we invite the attention of buyers.

No. 9 John Street, New York.

Factory, 46 Greene Street, Newark, N. J.

Ripley, Howland & Co.

MAKERS OF



FINE JEWELRY.



Would respectfully call attention to their patent PLATINUM TIPPED Settings for Diamonds (just introduced), an advantage dealers will readily appreciate, as the stone is held, not by yellow, but by scarcely perceptible *white* points which are equally strong and more durable than gold.

These *white* points impart an elegant appearance to the gem and relieve the setting of that coarse and unattractive look usually found in those entirely composed of silver or platinum.

No. 35 Maiden Lane, New York.

FACTORY, No. 383 WASHINGTON STREET, BOSTON, MASS.

H. HELLER. WM. BARDEL.

HELLER & BARDEL,

MANUFACTURERS OF

DIAMOND JEWELRY,

And Dealers in Diamonds,

No. 18 John Street, New York.

☞We always keep on hand a full line of DIAMONDS, mounted and unmounted; also, a large assortment of first-class DIAMOND MOUNTINGS of our own make, which we will send for selection on receipt of reference.

J. H. PURDY & CO.,

Jobbers of Imported and Domestic

TOOLS & MATERIALS,

For the use of Watchmakers, Jewelers, and kindred trades.

WATCH GUARDS, JEWELRY BOXES, SPECTACLES, CARDS, SPECTACLE CASES, PEARL GOODS, STEEL CHAINS, TAGS, RUBBER TYPE, &c.

No. 170 State Street, Chicago, Ill.

OFFICE WITH CHAS. WENDELL & CO.

Antique Candlesticks,

SCONCES.

ARCHER & PANCOAST M'F'G CO.,

No. 67 Greene Street,
Nos. 68, 70 and 72 Wooster Street,
NEW YORK.



WM. C. GREENE. B. W. GREENE. GEO. D. BRIGGS.

TELL A. BEGUELIN,

(Successor to the late GINNEL & BRO.)

Importer of Watches

WATCH MATERIALS, TOOLS AND GLASSES,

No. 71 NASSAU STREET,

(UP STAIRS),

CORNER JOHN STREET **NEW YORK.**

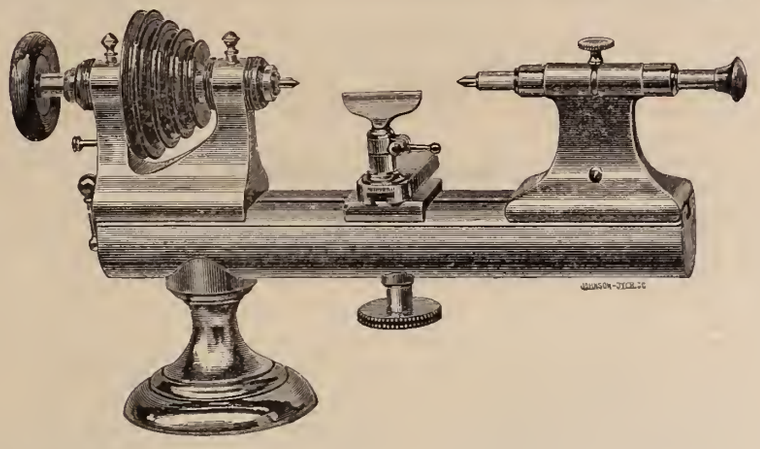
Sole Importer of the TELL A. BEGUELIN'S BEST MAINSPRINGS.

☞Every description of Watches carefully repaired for the Trade.

American Watch Tool Co.

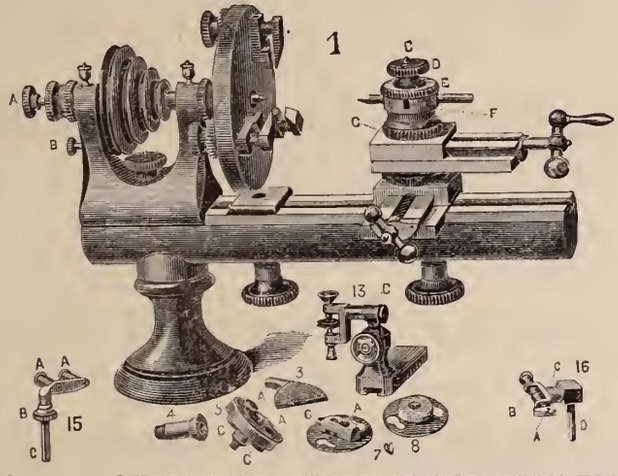
Formerly J. E. Whitcomb & Co.

Manufacturers of Watch & Chronometer Makers' Tools.



P. O. Box 999. WALTHAM, MASS

HOPKINS' WATCH TOOL CO.



Manufacturers of **HOPKINS' PATENT WATCHMAKERS' TOOLS**, embracing Plain and Combination Lathes, Chucks, Slide and Swing Rests, Gear Cutters, Pivot Polishers, Jeweling and Staking Tools, &c.
Illustrated circulars sent on application.
HOPKINS' WATCH TOOL CO., Waltham, Mass.

Medal and Diploma of Merit
Awarded by Centennial Com.

S. C. JACKSON,

MANUFACTURER OF FINE

CASES

For Jewelry, Silver Ware, Trays, &c.

180

BROADWAY,

NEW YORK.



Notice to the Trade.

THE CENTENNIAL 1876 C & B TRADE MARK REGISTERED

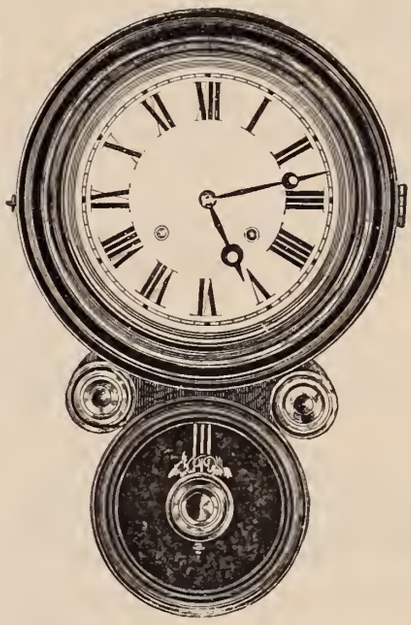
The above cut represents our Trade Mark of the **"Centennial Watch,"** of which we are the sole manufacturers. We deem it proper to caution the Trade against imitations of it by unscrupulous parties who are endeavoring to palm off inferior goods advertised as "Centennial Watches." We shall take legal steps to have it stopped, and shall prosecute all infringements of our rights in the premises.

Cross & Beguelin,

No. 21 Maiden Lane, New York.



Fac-simile of the "Centennial Watch."



E. INGRAHAM & CO.,

Bristol, Conn.,

MANUFACTURERS OF

American Clocks,

Of Every Description.

WAREHOUSE,
No. 8 CORTLANDT STREET,
NEW YORK.



REMOVED TO No. 658 BROADWAY.

MANUFACTURERS OF EXCLUSIVELY

BLACK ONYX GOODS,

WOGLOM & MILLER,
32 & 34 JOHN STREET.
NEW YORK.

H. Muhr's Sons, Philadelphia.

MANUFACTURING JEWELERS,
Solid Gold Finger Rings of Every Description.



Crown, 18k. Lion.



On and after January 1st, 1876, our make of Filled Plain Rings will be stamped as above, which stamp is copy righted. Any and every infringement on the above Trade Mark will be dealt with according to law. ☞ Every one warranted.

THESE GOODS ARE SOLD BY ALL THE LEADING JOBBERS!

Should the house that any retailer deals with not have them we will furnish them with the address of the nearest Jobber. ☞ SELL TO THE JOBBING TRADE ONLY!

New York Office, 11 Maiden Lane.

☞ Address all communications to Philadelphia.

H. HOWARD. A. NICOUD. A. J. SCHERRIEBLE.

H. HOWARD & CO.

Manufacturing Jewelers,

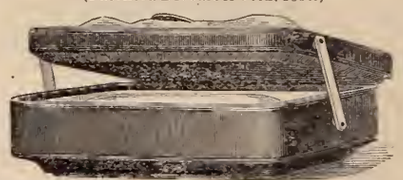
No. 14 JOHN STREET, New York.

Factory, 102 Orange Street, Providence, R. I.

Novelties in Stock Plate a Specialty.

ESTABLISHED 1854. ☞ Medal and Diploma Awarded at Centennial Exhibition.
JUDGES' REPORT:—Well made and good patterns—Double Hinge as a useful improvement.
(Patented December 17th, 1867.)





G. F. KOLB & SON,

MANUFACTURERS OF FINE

Morocco, Velvet and Cabinet Cases,

FOR JEWELRY, WATCHES & SILVERWARE.

TRAYS FOR SHOW CASES, TRUNKS, &C.

732 Sansom Street, PHILADELPHIA.

TRADE MARK

BOOZ & THOMAS,

MANUFACTURERS OF

Watch Cases & Jewelry,

108 SOUTH EIGHTH STREET,

Second Story, PHILADELPHIA.

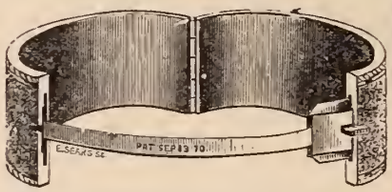
Illustrated Catalogues sent upon application.

Old Gold & Silver Bought or Exchanged.

PARTICULAR ATTENTION PAID TO REPAIRING.

Established 1845.

WM. H. BALL, Successor to BALL & BARNARD,



Manufacturing Jeweler,

Fine Gold, Enameled and Colored

BRACELETS,

A SPECIALTY!

With Patent Guard Attachment at NO EXTRA *cost.*

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Factory, 30 Franklin Street, Newark, N. J.

EDW. A. LAUTEN,

MANUFACTURER OF

Morocco, Velvet and Satin Cases,

FOR JEWELRY, WATCHES AND SILVERWARE,

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SEND FOR REDUCED PRICE LIST.

T. B. BYNNER,

IMPORTER AND JOBBER OF

WATCHES,

DIAMONDS AND FINE JEWELRY,

AND DEALER IN THE

BEST CLASS OF ROLLED PLATE JEWELRY

—AND—

Key and Stem-Winding American Watches,

No. 513 BROADWAY, NEW YORK.

Dealers in Watches

And DIAMONDS,

OPPENHEIMER, BROS. & VEITH,

Manufacturing Jewelers,

No. 35 MAIDEN LANE,

[Formerly 23],

S. Oppenheimer, A. Oppenheimer, } **New York.** { Henry F. Veith. Gus. F. Veith,

---

I. PFORZHEIMER. D. KELLER.

PFORZHEIMER & KELLER,

IMPORTERS OF

Watches and Diamonds

Dealers in American Watches,

AND

Manufacturers of Jewelry,

No. 24 JOHN STREET,

P. O. Box 4144. **NEW YORK.**

E. A. HALDIMAN.

IMPORTER OF

Watches, Watch Materials,

AND OPTICAL GOODS;

Also DEALER IN JEWELRY,

No. 66 Nassau Street, New York.

☞I am preparing for the convenience of country dealers a price list of the above goods. PRICES GREATLY REDUCED.

CRYSTAL CHANDELIERS,

Gilt, Bronze and Decorated Gas Fixtures,

FINE MARBLE AND BRONZE CLOCKS,

Bronze Figures and Ornaments in Greatest Variety, at Low Prices,

MANUFACTURED BY

Mitchell, Vance & Co.,

Nos. 836 & 838 Broadway, New York.

"Medal of Special Award," by American Institute, 1872.

No. 719, GAS FIXTURES.

MITCHELL, VANCE & Co., 597 Broadway, N. Y.:

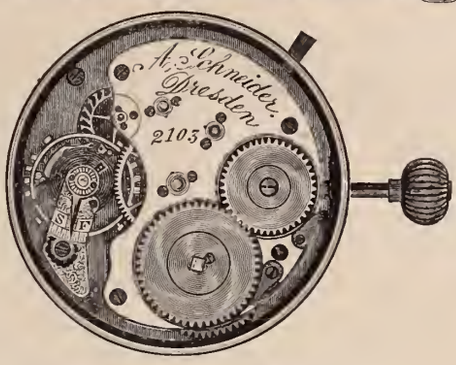
"We find the above-mentioned Fixtures and Glass Chandeliers, for design excellence of workmanship and finish in all their parts, to be the best production in the country and we may say, in our judgment, excelled by no other country in WORLD.

"We recommend a MEDAL OF SPECIAL AWARD for CHANDELIERS and GAS FIXTURES. (Signed) JOHN W. CHAMBERS, Secretary.

Medal of Special Award confirmed.

MAX FREUND & CO.

Manufacturing Jewelers.



IMPORTERS OF

Watches

Jewelry and Precious Stones,

8 Maiden Lane,

NEW YORK.

☞Sole Agents for the Celebrated A. Schneider Watch, Dresden.

Goldsmith & Schliesser,

Manufacturing Jewelers,

—AND—

Importers of Diamonds & Watches,

No. 5 Maiden Lane,

Factory, 56 West 4th Street, **NEW YORK.**

Celluloid Novelty Comp'y,

W. S. SILLCOCKS, President. F. R. LEFFERTS, Sec'y and Treas.



MANUFACTURERS OF

IMITATION

Coral Jewelry.

4 Maiden Lane, New York.

☞Our goods are sold by all the leading jobbers in the country.

Established 1859.

ERRICO BROTHERS,

Importers & Manufacturers of Coral, Silver Filigree and Conch Shell Jewelry of New and Beautiful Designs,

No. 19 John Street, New York. { Manufactory, 39 St. Catarina, Chiaja, Naples, Italy.

CORAL JEWELRY.—Our stock of Coral is unusually complete and attractive, embracing the widest range of styles, patterns and shades, peculiarly desirable for the requirements of this market, while our assortment of loose goods for manufacturing purposes is almost illimitable

SILVER FILIGREE.—We would call the special attention of buyers to this line of goods Our stock is one of the most complete and varied to be found in the city, and consists of Combs, Necklaces, Lockets, Pins, Earrings, Hair Pins, Charms, etc., in almost endless variety.

CONCH SHELL.—Of which we have a great variety of the most artistic designs, either mounted or unmounted. They are very desirable goods, and are competing with the finer class of stone cameos.

CONCH SHELL & ONYX.—The latest novelty introduced by us this season is a pleasing combination which promises to become exceedingly popular.

☞ Buyers visiting the city are cordially invited to examine our stock.

THE AMERICAN WATCH COMPANY.

TO avoid imposition, purchasers of Waltham Watches will observe that every genuine watch, whether gold or silver, bears our trade mark on both case and movement.

Gold cases are stamped "A. W. Co." and guarantee certificates accompany them. Silver cases are stamped "Am. Watch Co., Waltham, Mass. Coin Silver," or, "Am. Watch Co., Waltham, Mass., Sterling Silver," according to quality, accompanied by guarantee certificates signed R. E. Robbins, Treasurer. The name "Waltham" is plainly engraved upon all movements, irrespective of other distinguishing marks.

This caution is rendered necessary by reason of the fact that our cases are frequently separated from our movements, and put upon worthless movements of other makers, and *vice versa*, thus affecting injuriously the performance of the watches and vitiating our guarantee, which is intended to cover only our complete watches wholly made by us. It is necessary also because it is so notorious as to be a public scandal, that there is a great fraud in the metal quality of both gold and silver cases as now generally sold. We have demonstrated by frequent assays that many gold and silver cases offered in the market, are debased from 10 to 20 per cent. from the quality they assume to be. This is a fraud upon the purchaser, and accounts for the low price at which such cased watches have been sold.

We take this occasion to announce that we have recently entirely remodeled the very popular grades of full plate movements, known by the marks, "Wm. Ellery," "Appleton, Tracy & Co.," "Waltham Watch Co.," "P. S. Bartlett," and "Broadway," giving to them not only a highly improved appearance, but great additional value. We embody in them such of the best results of our experience and study for twenty years as can be useful in this popular form of watch. We give these new model watches special recommendation to all who look for good performance and solid excellence at moderate cost. The alterations have been made with the view of pleasing practical watch makers, as well as watch wearers.

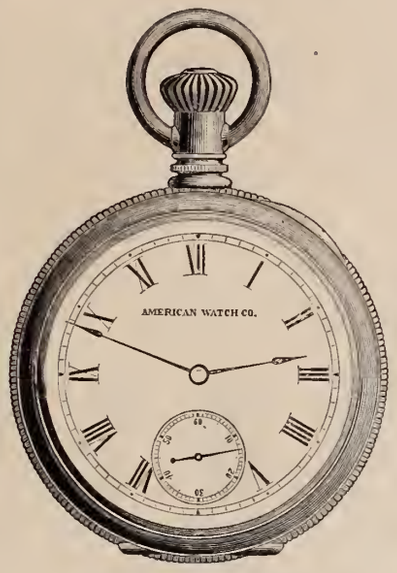
We avail ourselves too of this occasion to warn the public against CHEAP watches. The superiority of Waltham goods in all grades, is now so generally acknowledged that our competitors, Swiss and American, seem to have no resource but to present the attraction of low price. Their goods being inferior to ours, they have them for what they can get. Times are hard, and people generally not knowing a good watch from a bad one, very often allow a small price to decide them. William Morris, the eminent English lecturer on art and labor topics, in a recent lecture delivered before the "Trades Guild," says:

"I know that the public in general, are set on having things cheap, being so ignorant that they do not know when they get them nasty, also, so ignorant that they neither know nor care whether they give a man his due; I know that the manufacturers, 'so called,' are so set on carrying out competition to its utmost, competition of cheapness, not of excellence, that they meet the bargain-hunters half way, and cheerfully furnish them with nasty wares at the cheap rate they are asked for, by means of what can be called by no prettier name than fraud."

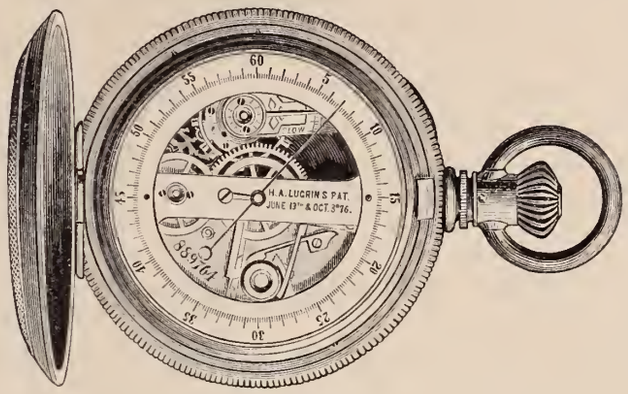
We are much mistaken if this is what the public wants or expects, of us at least. Good watches cannot be made when neither workman nor employer has pride in his occupation; interest and pleasure in the work are both wanting, and both are essential to good watch-making. Low price, especially in Watches, MEANS LOW QUALITY WITH LOW PERFORMANCE AND HIGH REPAIRS. Watches cannot be made for nothing even by machinery.

Our mission was, and our business is to make good watches whatever the cost; holding firmly to this single purpose, we have seen improvement in quality and reduction in cost, by means of discoveries and improvements in machinery and by natural causes, go steadily on together, until we can truly say, Waltham Watches in their respective grades are the BEST WATCHES made, and as to the lower grades they are within reach of everybody who earns wages. Our prices are as low as they ought to be and as low as they will be. We say to the public, buy a good watch while you are about it, and pay a proper price for it. The more you pay an honest dealer, the better satisfied you will be in the end; don't be deceived by cheapness—quality descends faster than price.

ROBBINS & APPLETON, General Agents.



Front view of Watch,
Showing regular Time Dial.



Back view of Watch,
Showing Chronograph.

DEAR SIR:

The above is a cut of the WALTHAM WATCH with CHRONOGRAPH ATTACHMENT. This is attached to our 14th Size, (Gents') Stem-Winding and Stem Setting movement, either gilded or nickel. The Chronograph beats fifth of seconds, and is a fly-back, which works either from the stem or outside push piece, as may be desired.

We claim an advantage over the imported in this respect: it is applied to the back of the watch, thereby using a separate and independent dial, and not complicating the regular time dial as do the Swiss and all other imported Chronographs.

It is also very simple in construction, and in case of accident we can always supply duplicate parts which will not require fitting.

The dial of the Chronograph can be made solid if desired, so as to cover the works, which are represented as exposed in the above cut.

These Watches can be obtained from your local jeweler. If he has none in his stock, we can supply him at his request.

ROBBINS & APPLETON,

GENERAL AGENTS,

No. 9 Bond Street, New York.

EDWARD TODD & CO.

MANUFACTURERS OF

GOLD PENS,



Pencil Cases, Tooth Picks, &c.

No. 652 BROADWAY,

Factory, 29 & 31 South 11th St., Brooklyn. NEW YORK.

C. F. A. HINRICHS,

29, 31 and 33 PARK PLACE,

Cor of CHURCH STREET, (Up-stairs) NEW YORK

Successor to M. WERCKMEISTER.

[ESTABLISHED 1801.]

IMPORTER AND DEALER IN

FANCY GOODS,

GLASS-WARE,

China, Bronzes, Clocks, Toys, &c.

Sole Agents for the Glass Factories of the Company "ANN," Namuroise, Belgium

Depot for Archery, Cricket & Base Ball Implements.

And C. A. KLEEMANN'S CELEBRATED GERMAN STUDY LAMPS

Agent for ROGER'S GROUPS in Parian, &c.

WELCH & MILLER,

MANUFACTURERS OF

Jewelry Cases,

In Morocco Velvet, Satin, Rosewood & Black Walnut.

ALSO SILVER-WARE CASES,

No. 169 BROADWAY, NEW YORK.

☞Rosewood and Black Walnut Show Case Trays. Velvet Cases for Diamonds a specialty. Catalogues sent on application.



In placing these Oils before the Trade, we do so with entire confidence, from many years' experience in procuring them from the fish, and in their preparation for use, and more than all, the thorough and SEVERE TESTS they have been subjected to in use upon Chronometers in our whale ships, often absent from fifty or sixty months. ☞Liberal samples furnished on application.

ROSKOPF WATCH.

J. D. HUGUENIN & CO.,

GENERAL AGENTS,

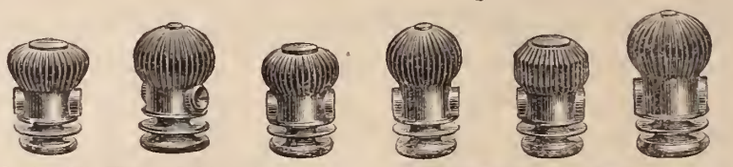
No. 12 Maiden Lane, New York.

The reputation of this Watch as an accurate timekeeper is fully established, and during the ten years that it has been before the Trade, has won an abiding reputation for fine Time-keeping qualities, and the BEST WATCH for the money in the world.

☞Send business card for price list.

MILNE & JOURDAIN,

Manufacturers of Stem-Winding Watch Crowns



13 & 15 Franklin Street, NEWARK, N. J.

Gold Crowns, for Stem-winding Movements, to suit all sizes of Imported or American Watches, in four different styles and seven sizes.

Gold Pushers for Key Movements in every size. Also Gold Crowns for fine Chronograph Watches made to order.

☞Silver Stem winding Crowns and Key Pushers on hand or made to order. Send for card and samples.

A. MILNE. A. JOURDAIN.

D. LIECHTY, B. LEVY.

D. LIECHTY & CO.

MANUFACTURERS OF

Gold & Silver Watch Cases,

IMPORTERS AND DEALERS IN

SWISS & AMERICAN WATCHES,

No. 402 Library Street,

PHILADELPHIA.

Lubricating Oils, for Watch, Clock and Chronometer Makers.

The discovery of a Lubricator for FINE MACHINERY, such as Watches, Clocks and Chronometers, that is free from gum and corrosive substances, has taxed the ingenuity of hundreds of men whose efforts have proved a failure. But we are happy to say (being largely interested) that such an article has been supplied by MR. EZRA KELLEY, of New Bedford Mass., who, after forty years study of the subject, has perfected a Lubricator that recomends itself to all who have used the *genuine*, (there having been numerous counterfeits in the market) as witness also the award of a Diploma and Medal by the judges of the late Centennial Exhibition at Philadelphia. We have no hesitation in saying that his Oils are the BEST manufactured, always uniform in quality and capable of standing all tests applied to lubricating oils. We cheerfully recommend it to all who may in their business require a FIRST-CLASS LUBRICATOR







AMERICAN CLOCK CO., (Hine & Thomas.)

P. S.—The above Oils can be procured at all first-class wholesale Watch and Clock Establishments in the Unit d States, as well as his only Agents, GRIMSHAW & BAXTER, 35 Goswell Street, London England.

New Bedford, October 15, 1877.



☞ "*Medal and Diploma awarded at Centennial Exposition for superior mechanical execution and artistic ornamentation.*"



Established in 1854.

C. & A. PEQUIGNOT,

Manufacturers of Watch Cases.

DEALERS IN AMERICAN WATCHES AND IMPORTERS OF FINE KEY AND STEM-WINDING MOVEMENTS,

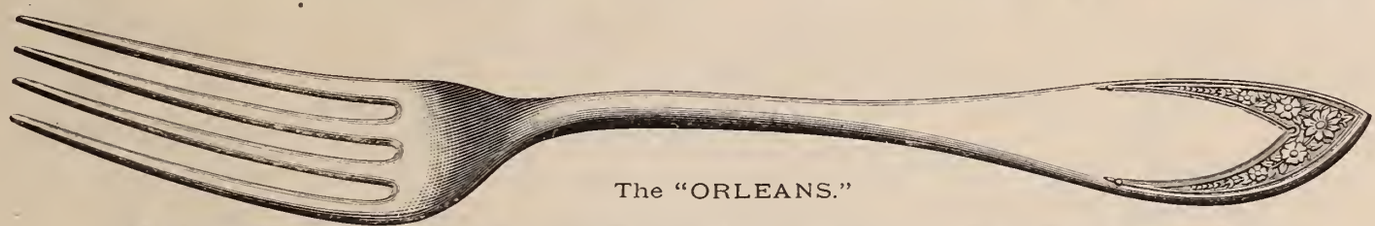
Salesroom & Manufactory, 22 South Fifth Street,

PHILADELPHIA.

A full stock of Key and Stem-Winding Gold Cases always on hand. Goods sent on approval when satisfactory references are furnished.

HALL, ELTON & CO.,

Manufacturers of the Finest Electro-Plated Ware.



The "ORLEANS."

UNSURPASSED IN QUALITY, STYLE AND FINISH!

Factories, Wallingford, Conn. Salesroom, 75 Chambers St., New York.

HOLMES, BOOTH & HAYDENS,

MANUFACTURERS OF

ELECTRO-SILVER PLATED

Spoons, Forks, Ladles, Fancy Pieces,

Solid Handle Steel Knives, &c., of the finest quality.

No. 49 Chambers Street, **NEW YORK.**

No. 18 Federal Street, **BOSTON.**

Works at Waterbury, Conn.

Established 1828.

JACOB BENNETT & SON,

Diamond Setters and Manufacturing Jewelers,

No. 108 SOUTH EIGHTH STREET, PHILADELPHIA.

WE MANUFACTURE AND MAKE A SPECIALTY OF
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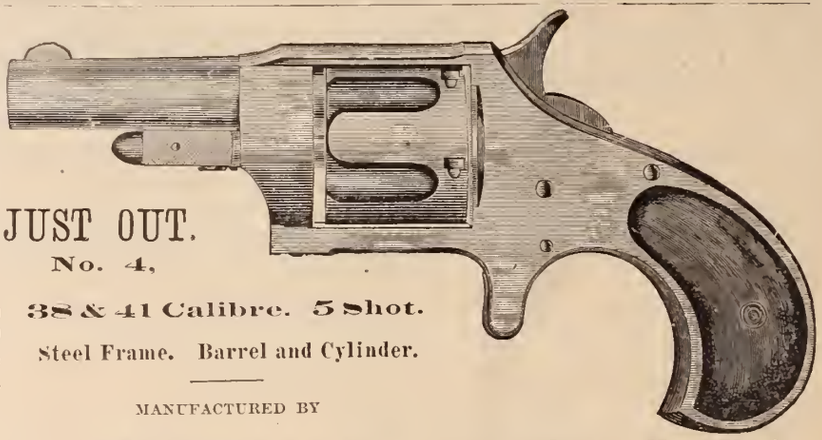
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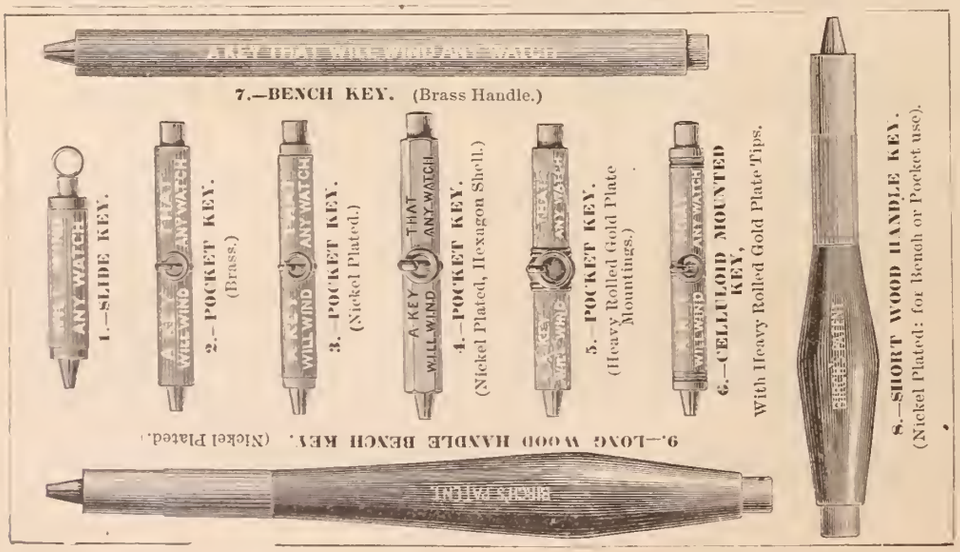
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NICOUD WATCH

N.H.H.

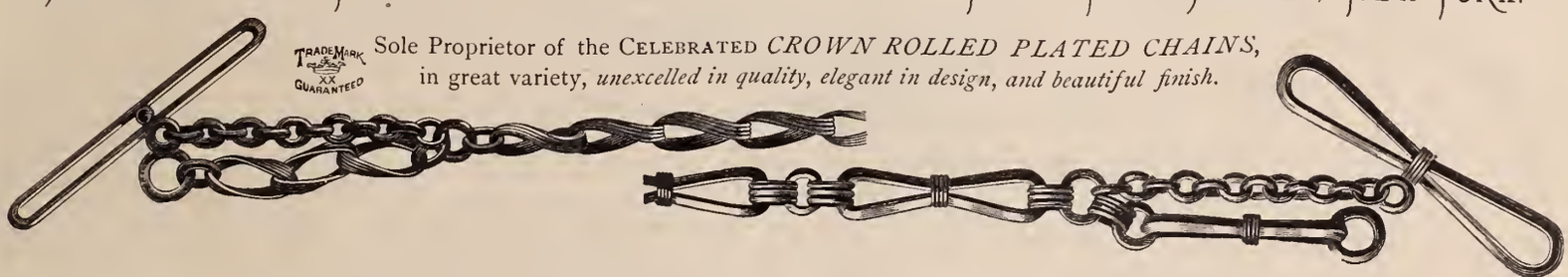
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All Watches fully warranted as to quality of Movements and Cases.

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2d, The illustrations are so accurate that dealers can make sales from the Catalogue with a certainty of pleasing their patrons when goods are received.

3d, Our system of publishing the Price List separate from the Illustrations does not expose profits, as other Catalogues have done.

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☞ *Goods sent for selection or examination on receipt of satisfactory references. Orders for engraving, ornamenting or refinishing nickel movements, and engraving inscriptions, devices, and monograms on cases promptly attended to.*

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STANDARD TIME-KEEPERS.

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and at the same time as cheap, *quality and finish* considered, as any in the market.

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ALL grades are gilded without annealing or softening the plates—an advantage appreciated by every intelligent watchmaker, and which, in movements without plate jewels, *insures* longer wear, and saves the dealer time and money in repairing movements during the period of his warrantee.

We now make "specials" of any grade on our list, *in any quantity*, engraving name and residence of *the dealer* on the plate, at our former regular charge,—those requiring these movements quickly should order in quantities of not less than five (5) of a grade.

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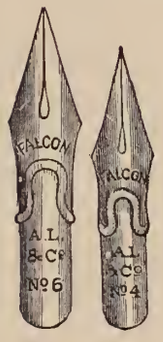
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SPRING TRADE, 1878.



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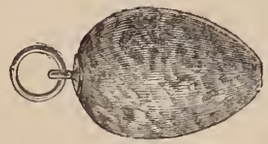


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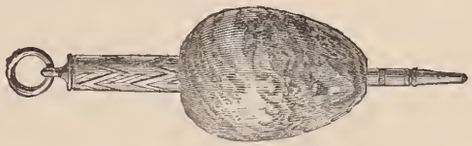
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The JEWELERS' CIRCULAR has acquired an enviable reputation, by its undeviating advocacy of the highest standard of commercial integrity, and its persistent opposition to those who dishonor and demoralize business by compromise and fraud. It has always been ready to promulgate and further plans and enterprises tending to the public good, and its columns have always been open to the honest expression of private opinion concerning matters which needed to be mended. Its information on commercial matters, much of which is nowhere else to be obtained, is of great importance and benefit, while the completeness of its trade directory and business columns render it indispensable to those concerned in the trade.

The JEWELERS' CIRCULAR is an art journal worthy of the artistic interests and industries which it represents. The technical articles are illustrated by carefully executed diagrams, and during the past year new designs and trade novelties have been presented, in splendid plates, printed in gold, silver and colors. Its elegant and tasteful typography is apparent in its advertising pages, where every announcement is rendered attractive and conspicuous.

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The April edition of the *forty-second* semi-annual volume of our Book of Reports is now prepared and is ready for distribution. This edition has been as thoroughly revised as that published in January, and brings the estimate of the capital and credit down three months later than that volume. It also contains new features which have never heretofore appeared in any commercial Reports. With a desire to give our book greater intrinsic value, we have incorporated under their respective heading a brief but concise description of the location of each and every city and village, stating if situated on a railroad (naming the same), and noting the fact, if a telegraph, post office, money order, and express office, thus covering all the information desired to make it a more complete book of reference for the counting-room, as well as the most reliable Shipping Guide ever offered to the public.

While this is a new departure, it seems most appropriate to place this information in conjunction with our reports, and we are confident it will meet a want which has long been felt by the grantors of credit.

While the object of our Agency is so well understood and so thoroughly appreciated as not to require a more extended notice at this time, we particularly desire to call your attention to that important department which we have brought to a greater degree of perfection even than that of the publication of our *Book of Reports*, viz :

DETAILED REPORTS.

For the further development of this important branch of our business not only do our special reporters visit the various cities and villages in the district assigned each office, and carefully revise the reports already on record, writing also more fully of those who have recently commenced business, but our correspondents are established in every town and hamlet, and are constantly advising us of the changes in the condition of all engaged in commercial pursuits. In addition to this, *each office in the whole connection* is required to transmit *daily* (to offices needing it) a copy of *all information* received by them (either from their travelers or correspondents), covering such trades as seek credit in other than local markets. By this system thousands of reports are being constantly interchanged (the average received by the larger offices during the past year having been more than **1,500 a day,**) the majority reaching their destination *within ten days from the time of leaving the correspondents' or travelers' hands.* The value of this *daily reciprocation* having proved so great and been so thoroughly commended by our patrons, we feel that we have touched the keynote, and that in future we shall anticipate the wants of all who need and seek information influencing commercial credits, whether of the local trade or that in the remotest places in the United States and British Provinces.

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1. The use of two volumes of our *BOOK OF REPORTS*, carefully revised, and issued four times a year, giving the name, business, estimated worth and credit of Merchants, Manufacturers and Banks in the United States and Dominion of Canada. Also, at a small additional cost, Pocket Editions of single States, for the use of Commercial Travelers.
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CHARLES F. CLARK, President.

New York, March, 1878.

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All Kinds of WATCHES Made To Order.



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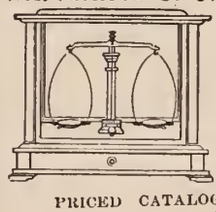
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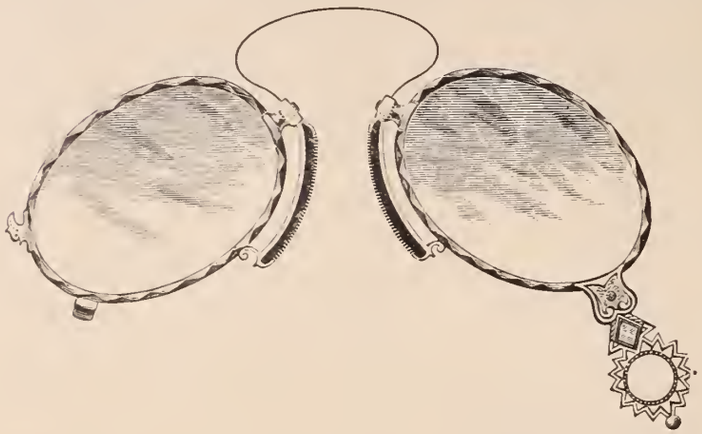
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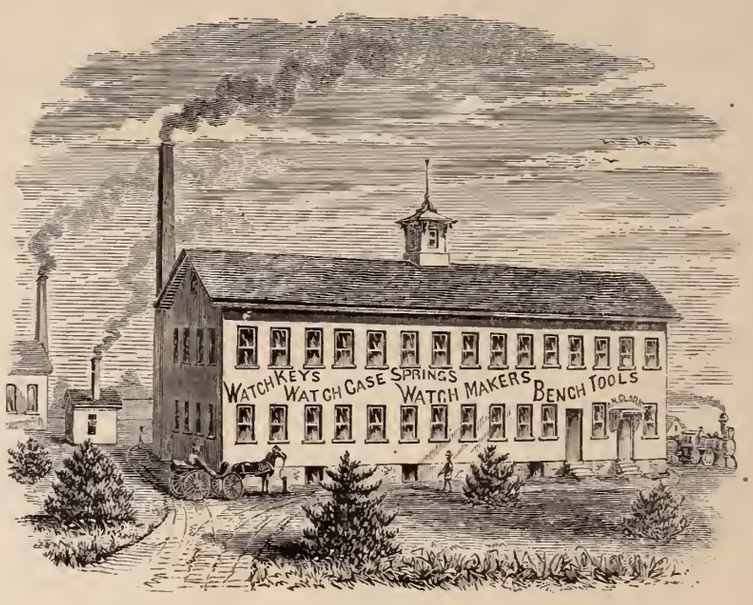
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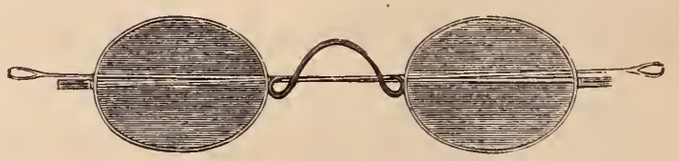
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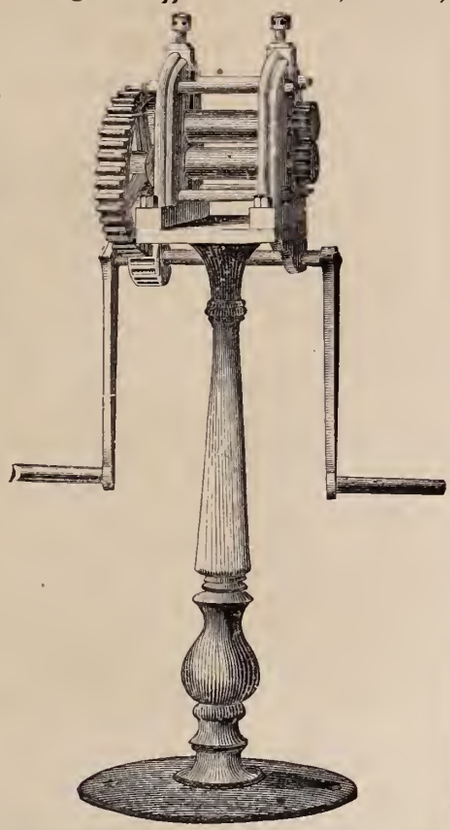
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Braun, Chr. E.—Manufacturer of Jewelry Boxes, Trays for ShowCases, &c., 62 Chatham stt.

Dahlem, W.—Manufacturer of Cases for Jewelry and Silverware, No. 85 Nassau Street, N. Y. Show Case Trays, &c., at the shortest notice.

Wiggers & Froelick—No. 60 Nassau street.—Manufacturers of Cases for Jewelry, &c., of every description. Trays for Show-cases, Stands for Show-windows, etc. Jewelers' Traveling Cases, light, convenient and strong.

Jackson, Samuel C.—Manufacturer of Boxes and Trays, for Silverware, Watches, Jewelry &c. 180 Broadway, N. Y.

Lauten, E. A.—Manufacturer of Boxes for Jewelers, Silverware Manufacturers, &c. No. 63 Prince Street, N. Y.

Sturn, I.—Manufacturer and Importer of Cases for Jewelry, Watches, Silverware, &c. No. 15 John street, N. Y.

Welch & Miller—Manufacturers of Morocco, Velvet, and Satin Jewelry Cases, Trays, &c. Complete stock on hand. 169 Broadway.

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Aikin, Lambert & Co.—Manufacturers. General stock of Reliable Jewelry, 12 Maiden Lane.

Alford, C. G. & Co., Manufacturers. General line fine and reliable goods. Specialties in Onyx goods and chain. 183 Broadway, New York.

Andrews, J. F.—Manufacturer of Fine Jewelry, Lockets, Sleeve Buttons and Rings in Stone Cameo, etc., a specialty. 35 Maiden Lane.

Baldwin, Sexton & Peterson,—Manufacturers Fine Jewelry. Whiting Building, Broadway and Fourth street.

Ball, Wm. H. Manufacturing Jeweler. Fine Gold Bracelets a Specialty. No. 9 John St., N. Y.

Barthman & Straat—Manufacturers of Fine Jewelry. Seal and Stone Rings a Specialty Orders promptly attended to. 41 Maiden L

Bissinger, E. & Co.—Importers Fine Jewelry, Lockets, Crosses, Neck Chains, &c., No. 192 Broadway.

Brown, Thos. G.—Manufacturer of Rich Jewelry Necklaces, Lockets, Bracelets, Sleeve Buttons, etc., 9 Bond street, N. Y.

Brainerd, Steele & Co.—Manufacturers of Fine Jewelry and Brainard's Patent Lockets. No. 9 Maiden Lane, New York.

Carrow, Crothers & Co.—Manufacturers of Fine Jewelry, Roman Band Bracelets, Lockets, Crosses, &c. 12 John Street, N. Y.

Carter, Howkins & Sloan.—Manufacturing Jewelers, Whiting Building, 4th St. & Broadway

Colby & Johnson.—Manufacturers of Fine Jewelry, and Importers of Watches. No. 17 Maiden Lane.

Chatellier & Spence,—Manufacturing Jewelers. No. 652 Broadway, N. Y.

Coe, Pinneo & Stevens.—Manufacturers of Fine Jewelry, Fine Gold Lockets and Linen Finished White Enameled Goods a Specialty, No. 9 Maiden Lane, N. Y.

Chatterton & Dodd—Successors to Fitch & Chatterton, Manufacturers of Fine Gold Jewelry, Chains, Band and Chain Bracelets, No. 19 John street, N. Y.

Demmert Bros. & Co.—Manufact'rs & Importers of Fine Jewelry, Cameo and Onyx Lockets, Sleeve Buttons and Sets a specialty. Old No. 9 Maiden Lane, New York.

Earle, M. A.,—Manufacturing Jeweler, Pearls, Cameos, and Diamond Mountings. No. 25 John Street. Ralph D. Earle, Agt.

Field & Co.—Manufacturing Jewelers, 8 Maiden Lane, N. Y.

Fitch, D. M. & Co.——Manufacturers of Fine Jewelry. Diamond and pearl mountings a specialty. No. 15 John street.

Frankel & Folkart,—Manufacturing of Seal, Cameo and Amethyst Rings, a Specialty. Ladies' and Gents' Lockets, Cameo Sets, &c. Also a full line of Diamond Settings, 192 Broadway, cor. John street, N. Y.

Geoffroy, A. R.—Manufacturing Jeweler, 4 Courtland street, N. Y. Manufacturer of Geoffroy Patent Stone Lined Sleeve Buttons, Studs and Collar Buttons.

Goddard, John M.—Manufacturing Jeweler,—Seal Rings and Fine Lockets a specialty, No. 25 Maiden Lane, N. Y.

Goldsmith & Schliesser,—Manufacturing Jewelers and Importers of Diamonds and Watches. No 5 Maiden Lane.

Greason, Bogart & Pierce, successors to Artbur, Rumrill & Co., 182 Broadway, manufacturers of fine jewelry and gold chains

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Howard, H. & Co.—Manufacturing Jewelers No. 14 John St., N. Y.

Hedges, A. J. & Co.—Manufacturing Jewelers 9 Maiden Lane.

Hartmann, P.—Manufacturer & Importer of Fine Gold, Diamond, and Filagree Silver Jewelry, No 36 Maiden Lane. P. O. Box 2,454.

Haskell, H. C.—Manufacturing Jeweler. Seal Rings a specialty. Special attention to Jobbing of every description. 12 John street.

Hunt & Owen.—Manufacturing Jewelers. Office, 5 Maiden Lane.

Hale & Mulford,—Manufacturers Rich Jewelry, Whiting Building, Broadway and 4th Street.

Jeanne Brothers.—Manufacturers of Diamond Mountings & Rich Jewelry. 1 Maiden Lane.

Kipper, Vogel & Co.—Manufacturers of Fine Jewelry. Etruscan Goods a specialty. No. 17 Maiden Lane.

Keller, Chas. & Co.—Manufacturing Jewelers Lockets a Specialty. No. 13 John St., N. Y.

Kuhn & Doerflinger—Manufacturers of Enamel'd and Roman Band Bracelets, also Fine Lockets and Pendants, 18 John street.

Lennon, John D.—Manufacturing Jeweler, 142 Fulton street. Flat, and Half-round Gold Bracelets, Roman and Stone Lockets.

Moore & Horton.—11 Maiden Lane, Manufacturing Jewelers, Rings, Studs, Collar and Sleeve Buttons, Pins, Ear-rings, &c.

Mitchell, Noah.—Manufacturer of Fine Gold Jewelry, 694 and 696 Broadway, N. Y.

Miller Bros.—Manufacturers of Fine Jewelry Lockets, Sleeve Buttons, Studs, etc., etc. 11 Maiden Lane, New York.

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Owen, G. & S. & Co.—Manufacturing Jewelers. Office, No. 5 Maiden Lane.

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Riley, J. A. & Co.—Manufacturing Jewelers, Etruscan Gold and Coral Sets, Roman Bracelets, Necklaces, etc. Onyx Goods a specialty. 7 and 9 Bond street, New York.

Richardson, Enos & Co.—Manufacturers of Fine Gold Jewelry, Gold Chains, Lockets, Crosses and Necklaces. Colored and Etruscan Work. No. 23 Maiden Lane, New York.

Richardson, J. W. & Co.—Manufacturers of Jewelry, Masonic and other emblems. 196 Broadway, Manufactory, Providence, R.I.

Sexton & Cole—Manufacturing Jewelers, Colored Gold and Onyx Goods a specialty. No. 61 Nassau street, N. Y.

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Stites E.—(Late E. & D. H. Stites, and Saffen & Stites), Manufact'ring Jeweler, 12 Maiden Lane.

Sturdy Bros. & Co.—Manufacturers of Jewelry, No. 14 Maiden Lane, New York.

Spiess & Rosswog—Manufacturers of Fine Jewelry and Diamond Goods, Nos. 9 and 11 Maiden Lane, N. Y.

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Fradley, J. F.—Manufacturer of Fine Gold and Silver-headed Walking Canes and Sterling Silverware. Office and Factory, No. 21 John street, N. Y.

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Springfield Watch Co.—Factory, Springfield, Ill. Office, 11 Maiden Lane.

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Droz, Henry E.—Importer of Watches and Watch Case manufacturer. Agent for the "E. Perregaux" Watch, and jobber in American Watches, No. 92 Fulton Street, N. Y.

Freund Max & Co.—Importers of Watches Jewelry and Precious Stones, 8 Maiden Lane

Ginnel, Henry—Importer of Watches, Tools and Materials. No. 31 Maiden Lane, N. Y. P. O. Box, 2967

Hyde's Sons, John E.—Wholesale Commission Agents only, for Jules Jurgensen, of Copenhagen, Ed. Perregaux, Locle, Monard Freres, Geneva, Watches, and of other makers of every quality. No. 22 Maiden Lane

Keller, L. H. & Co.—(Successors to G. A. Huguenin,) Importers of Fine Watch and French Clock Materials, No. 64 Nassau street, N. Y.

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Mathey, L. & A.—Importers of Fine Watches and Sole Agents for the **H. L. Matile's** Watches, No. 119 Fulton Street, N. Y.

May & Stern—Importers of Foreign Watches, Materials and Tools, etc. Manufacturing Jewelers. No. 20 John St., N. Y.

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Stern Brothers & Co.—Importers of Swiss Watches and wholesale dealers in American Watches. &c., No. 33 John Street, N. Y.

Scott, J. T. & Co.—Importers of Watches, and Manufacturers of Jewelry, and Jobbers of all grades American Watches. No. 11 Maiden Lane, N. Y.

Strasburger, Louis & Co.—Importers and Makers of Watches of every description. No. 15 Maiden Lane.

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Waaser, F.—Importer of Watches, Materials, Tools, &c., Sole Agent for Ducommun's Main Springs, 52 Nassau street, N. Y.

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Brown, J. A. & Co.—Manufacturers of The Ladd Patent Stiffened Gold Watch Cases, &c., 11 Maiden Lane, N. Y. Factory, 58 Eddy street, Providence, R. I.

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American Watch Company, of Waltham, Mass. No. 170 State street, Chicago.

Charpier & Wathier.—Watchmakers and jewelers for the trade, and dealers in all kinds of watch materials. 61 West Kinzie street.

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Purdy, J. H. & Co.—Jobbers of large and small Tools and Materials, for the use of Watchmakers, Jewelers, and kindred Trades. Spectacles—Jewelry Boxes, Plated Chains, &c., &c. No. 170 State street.

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Irons, Chas. F.—Manufacturer of Solid Gold Jewelry. Specialty Emblems, Pins and Charms Masonic, Odd Fellows, &c. 102 Friendship St.

Perkins, C. H.—Successor to Davis, Platt & Co, Manufacturer of Fine Gold Jewelry. Specialty, Ladies' Setts, Brooches and Earrings. No. 20 Conduit St., Providence, R. I.

Potter, Charles L.—Manufacturer of Pearl Shell Goods, Patent Spiral Studs a specialty, 407 Pine street, Providence, R. I.

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85

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437


861




128




435


375


429


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836






137


469


110


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868



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3



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93



864



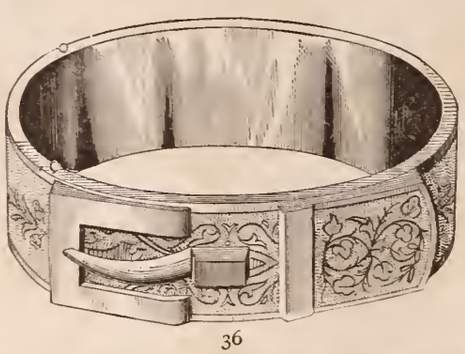
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257



420



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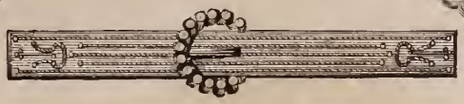


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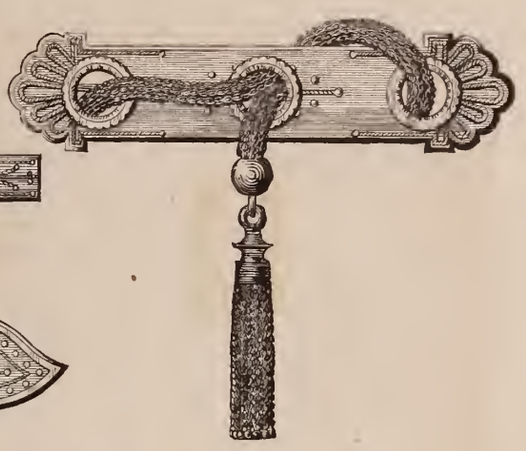
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790


275


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881


791


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335


272

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171 100


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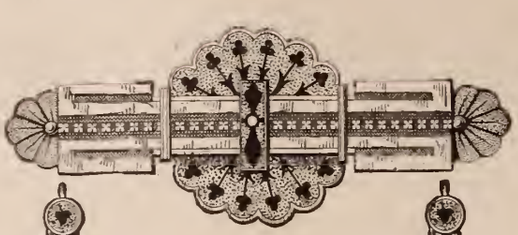

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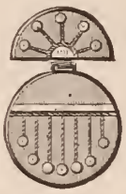
These new designs in Gold and Plated Jewelry, from our stock, are photographed from the articles themselves, then engraved, and are truthful representations.

C. G. ALFORD & CO., 183 Broadway, New York.


478


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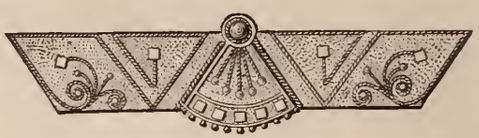

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782



L. HAMMEL. LOUIS RUNKEL.

L. HAMMEL & CO.,

Importers of Watch Materials, Tools,

Watch Glasses, Silk Guards, Spectacles, Opera Glasses, Optical Goods, &c.

☞ Sole Agents in the United States for **G. B. Wheeler's Star Watch and Clock Oil,** and the Celebrated **Gravier Mainspring.**

☞ We would respectfully call the attention of the Trade to the celebrated **Star Spectacles and Eye Glasses,** of which we are the Sole Importers.

We would call the especial attention of the Trade to the celebrated PANTASCOPIC STAR SPECTACLES. they are the best made goods in this market! The frames of these Spectacles are light, finely tempered and highly finished, while the lenses are remarkable for their clearness, purity, and freedom from specks and flaws.

☞ Send for Price List.

L. HAMMEL & CO., No. 9 Maiden Lane, New York.



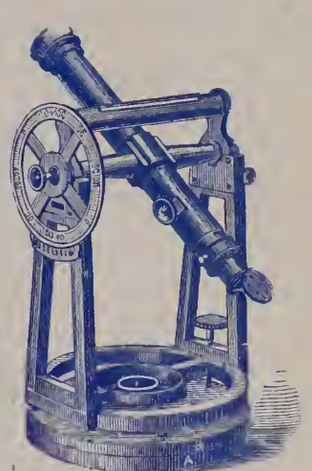
Standard Marine Chronometer
FOR KEEPING CORRECT TIME.

JOHN BLISS & CO.

STANDARD MARINE

Chronometers and Transits,

FOR WATCHMAKERS' USE.



No. 10

110 WALL STREET, NEW YORK.

IMPORTANT NOTICE.—These Transits are readily set in position without the aid of strictly correct time as a basis for that purpose. Printed instructions, easily understood, accompany each Instrument, and no calculations are required preliminary to setting in position.

As a trial only is required to insure unqualified approval, we are induced to make the following **LIBERAL OFFER**—On receipt by us of satisfactory reference, and 10 per cent. of the price, we will send one of the foregoing Transit Instruments, on hire or trial, for one month, with full printed instructions for setting up and using the same, and if purchased after trial, we will allow the whole hire to apply in part payment, and sell the Instrument on approved note at four months for the balance. Special terms for payment by installments, after trial, on application. We do not make this offer merely to hire these instruments, but to insure a trial with a view to sales, the hire received being only sufficient to cover the cost of repolishing in case they are returned. Send for Illustrated Circular giving full description.

JOHN BLISS & CO., 110 Wall Street, New York

E. Aug. Neresheimer,

IMPORTER OF DIAMONDS,

—AND—

Manufacturer of Fine DIAMOND JEWELRY,

No. 21 Maiden Lane,

NEW YORK.



HENRY MAY. Established 1854. JOSEPH STERN.

MAY & STERN,

IMPORTERS OF

Foreign Watches, Materials and Tools

AGENTS FOR THE SALE OF ALL

DOMESTIC MOVEMENTS AND CASES,

And MANUFACTURING JEWELERS

No. 20 John Street, New York.

☞ Will Remove May 1st to No. 19 John St.

☞ SOLID GOLD SEAL RINGS, in Cameo, Amethyst, Topaz and Onyx, A SPECIALTY.

L. LELONG & BROTHER,

GOLD & SILVER REFINERS,

Assayers and Sweep Smelters,

S. W. Cor. Halsey & Marshall Streets,

NEWARK, N. J.

SWEEPINGS A SPECIALTY.

CHAS. KELLER & CO.,

No. 18 John Street, New York.



☞ Patented March 28th, 1876.

MANUFACTURE the above PATENTED LOCKET,

In plain gold, and with fine onyx and cameo fronts, to hold 2, 4 and 6 pictures.

☞ FOR SALE BY THE BETTER CLASS OF JOBBERS. ☜

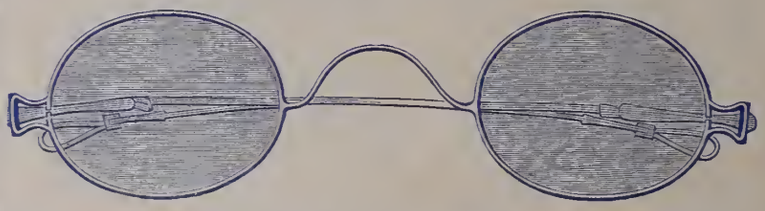
ALBERT LORSCH,

MANUFACTURER OF

PATENT ACCOMMODATING

Spectacles and Eye Glasses,

In Gold, Silver, Steel, &c.



Also Latest Novelties in Fine WATCHES & JEWELRY.

PRICES REDUCED TO SPECIE BASIS.

☞ I would call especial attention that with the above Spectacles and Eye Glasses it is only necessary to have one complete assortment of the different kinds of lenses, which being of uniform size, will interchange in all the different kinds of frames, thus giving a complete assortment for a comparatively small outlay

ALBERT LORSCH, 37 Maiden Lane, New York.

LORSCH BROS., 120 Sutter St., San Francisco, Cal.

L. & M. KAHN,

Importers of

WATCHES

Sole Agents for
James Kahn.
E. Bourquin & Fils
AND
Alphonse Matile
WATCHES.

112 Kearny St.
San Francisco,
CALIFORNIA.

5 Rue des Alpes,
Geneva,
SWITZERLAND.

No. 10 Maiden Lane, New York.

Manufacturers of the EAGLE TIMER ! *the Best in the market.*

Volume IX. No. 4

MAY, 1878



JEWELERS CIRCULAR.

D. F. HOPKINSON, PUBLISHER.

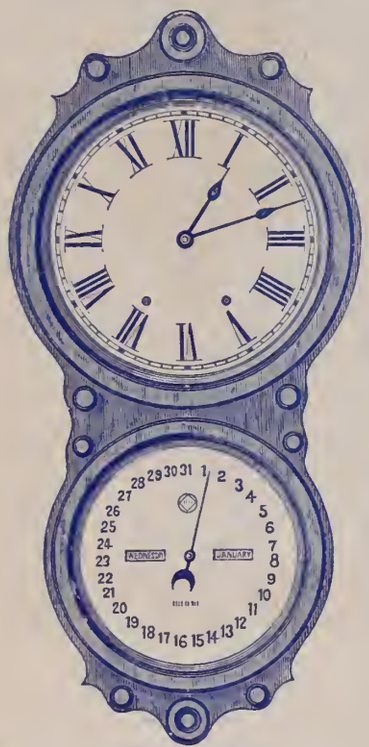
42 NASSAU STREET, NEW YORK.

American Clock Co.

581 BROADWAY, NEW YORK.

No. 172 State Street, Chicago. No. 7 Montgomery St., San Francisco.

Office Calendar.



No. 6.

SOLE AGENTS IN AMERICA FOR

E. N. Welch M'f'g Co. **New Haven Clock Co.**

Seth Thomas Clock Co. **Welch, Spring & Co.**

Seth Thomas Sons & Co.

A. S. Hotchkiss' Tower Clocks,

(Made by the Seth Thomas Clock Co.)

A NEW

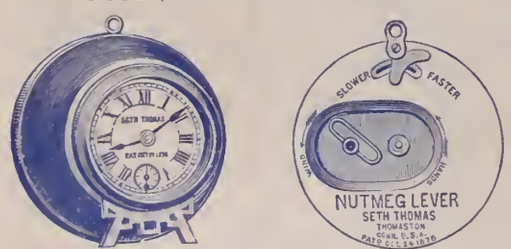
Seth Thomas Calendar Clock.

Eight-day Spring Time; Eight-day Spring Strike.

12 Inch Time Dial. **10 Inch Calendar Dial.** **Hight, 32 Inches.**

SETH THOMAS

"NUTMEG" LEVER,
Front. Back.



30 Hour Nutmeg, Brass.
30 Hour Nutmeg, Nickel.

A Small Lever Time-piece

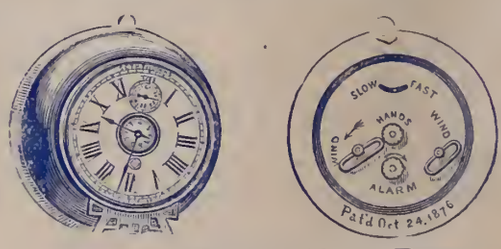
WINDS, SETS AND REGULATES

AT THE BACK.

HANGS UP OR STANDS UP.

WINDER ATTACHED TO CLOCK.

"NUTMEG" ALARM LEVER.
Front. Back.



30 Hour Nutmeg Alarm, Brass.
30 Hour Nutmeg Alarm, Nickel.

Scale, One Quarter Size. 3 Inch Dial.

AMERICAN CLOCK COMPANY,

HINE & THOMAS.

F. KROEBER,

No. 8 CORTLANDT STREET, NEW YORK.

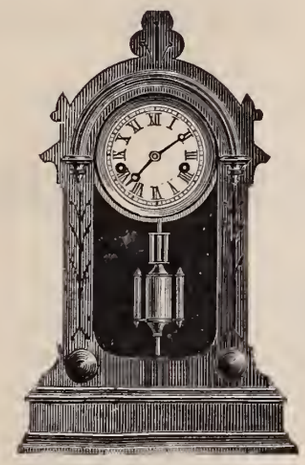
MANUFACTURER AND DEALER IN EVERY DESCRIPTION OF

AMERICAN CLOCKS.

WALNUT CLOCKS OF A SUPERIOR GRADE A SPECIALTY.



"PEEP O'DAY," ALARM
1-Day, Height 5½ inches.



"GUARD."—Walnut.
1-Day Strike; Height, 15 inches.
List Price, $4.50.



"RELIEF."—Walnut.
1-Day Strike; Height, 15 inches.
List Price, $4.50.



REGULATOR No. 34—Walnut.
8-Day Strike; Height, 25 inches.
List Price, $9.00.

ESTABLISHED 1857.

Waterbury Clock Comp'y

MANUFACTURERS OF AND DEALERS IN EVERY DESCRIPTION OF

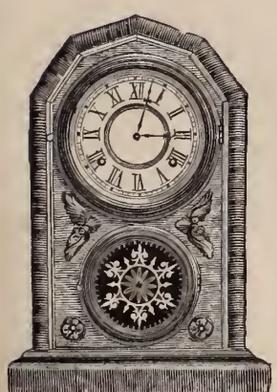
AMERICAN CLOCKS,

4 CORTLANDT ST., NEW YORK,

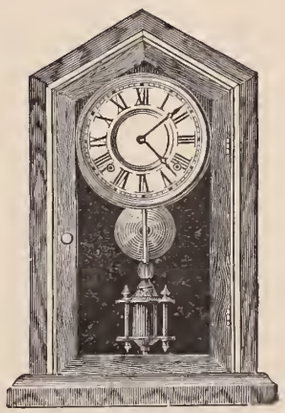
197 State St, CHICAGO.

31 & 33 Sutter St., SAN FRANCISCO.

MANUFACTORY, WATERBURY, CONN,



"CARDINAL."



"FLORENCE V.P."

M. BAILEY, Treasurer.

SOLE AGENTS FOR THE ITHACA CALENDAR CLOCK COMPANY.

Illustrated Catalogues and Price Lists furnished to the Trade upon application.



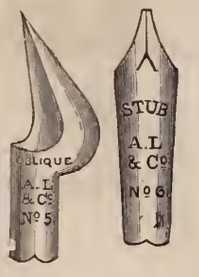
SPRING TRADE, 1878.

J. C. AIKIN, H. A. LAMBERT, J. B. SHEA.

AIKIN, LAMBERT & Co.,

MANUFACTURERS OF

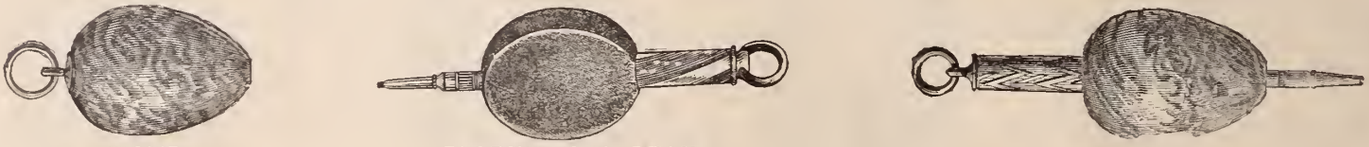
Gold Pens, Pencil Cases, Holders, Pencils, Picks,



And RELIABLE JEWELRY in great variety,

THE LATEST NOVELTIES!

Patent Egg Pencil Charms, artistically mounted in Celluloid and Florida Beans.



CLOSED. FLORIDA SEA BEAN. OPEN.

Pencil Charms, Watch Keys, Masonic Emblems, Initials, &c.

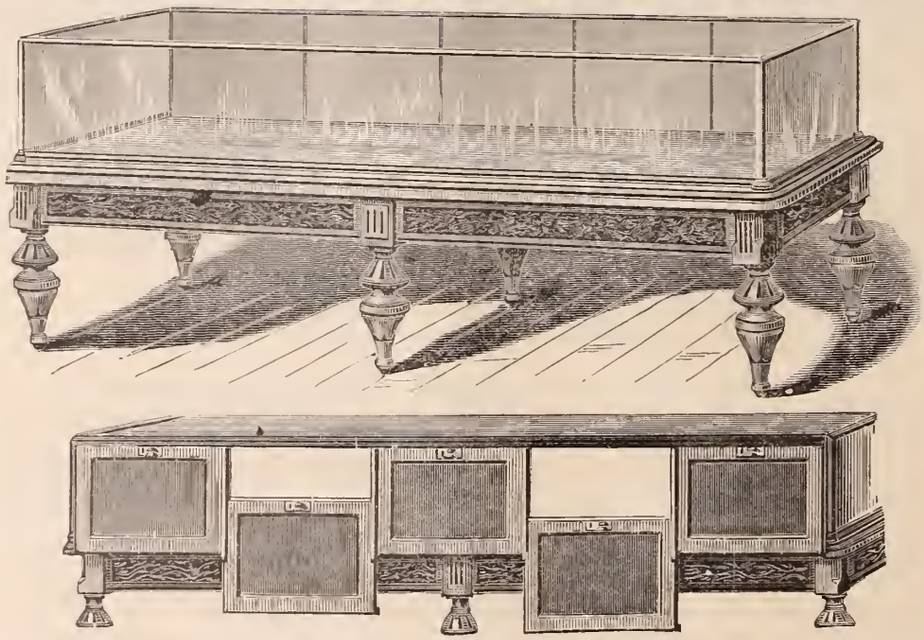
Our system of furnishing Show Case assortments, and establishing agencies, is broad, liberal and advantageous, and, as the originators of that method of display, now so popular with the Trade, we are offering liberal inducements to Agents. Prices recently reduced.

Illustrated Catalogues and Price Lists furnished upon application. Correspondence invited. Goods sent on approval when desired.

No. 23 MAIDEN LANE, NEW YORK.

PATENT IMPROVEMENT IN COUNTER SHOW CASES,

PERPENDICULAR SLIDING DOOR, DUST-TIGHT.



REAR VIEW OF CASE SHOWING SLIDING DOOR.

Its advantages are as follows:—The doors are more conveniently opened and closed, less liable to get out of repair or broken, articles are more easily reached in wide cases, mirrors are more safe, it dispenses with hinges, economizes room, excludes dust, and is air tight *when closed.*

☞ Drawings furnished and estimates given for fitting stores in cabinet work complete.

REFERENCES:—Gorham Mf'g Co., Rogers & Bro., Mitchell, Vance & Co.
Meriden Britannia Co., M. S. Smith & Co., Detroit, Mich.
D. Valentine, Syracuse, N Y.

B. & W. B. SMITH,

220 West 29th Street. New York.

Ansonia Clock Company,

MANUFACTURERS OF AMERICAN CLOCKS,

And IMPORTERS of CLOCKS of EVERY DESCRIPTION.

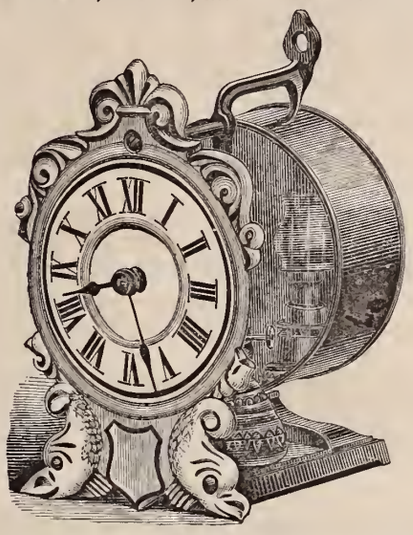
SALESROOMS: 19 & 21 CLIFF STREET, and 5 CORTLANDT STREET, (Near Broadway) **NEW YORK.**

FACTORIES ANSONIA, CONN., and 10th STREET, NEW YORK.



Peep O'Day Alarm.

One-half the size: Stem-Winding: Sets the alarm and winds at the back. "Only requires one spring" to be wound, and will go in any position.



Illuminated Night Light Clock.

For either Gas or Oil Lamp; will go in any position; Stem-winding.

Patented January 17th, 1878.



Alert Alarm,

One-half the size.

BELL INSIDE OF CASE; STEM-WINDING. Sets the alarm and hands at the back. "Only requires one spring to be wound," and will go in any position.

The above are excellent Time-keepers. Illustrations and prices on application.

A NEW LINE OF NOVELTIES WILL SHORTLY BE OFFERED.

LOUIS STRASBURGER & CO.,

Importers and Makers of Watches,

OF EVERY DESCRIPTION,

From the Finest Stem-Winding and Setting Goods to the Lowest Priced Watch in the Market.

OUR STOCK is unusually complete and attractive and embraces an assortment of the best COMMERCIAL WATCHES to be found anywhere ranging from $4.00 to $600 each.

We would also call the attention of buyers to our select display of fine TIMING and COMPLICATED WATCHES, CHRONOGRAPHS and REPEATERS, of every description, from the establishments of the most eminent makers.

☞We are also the Sole Agents for the INTERNATIONAL WATCH CO.'S WATCH, so well and favorably known in this market.

LOUIS STRASBURGER & CO.,

NO. 15 MAIDEN LANE, NEW YORK.

Diamond Bureau,
No. 30 Boulevard Houseman,
PARIS

WATCH FACTORY,
CHAUX DE FONDS, SWITZERLAND.

The Meriden Britannia Company,

UNION SQUARE, NEW YORK,

ARE MANUFACTURING AND HAVE ON EXHIBITION A CHOICE SELECTION OF DESIRABLE ARTICLES IN

FINE SILVER-PLATED WARE,

Combining every Modern Improvement in Plating and Elegance of Design, with Sterling Quality, and offer to the Trade the most Extensive and Attractive Assortment ever presented in this country. Also, a Large Variety of ORNAMENTAL ARTICLES, suitable for Presents. Our Assortment consists in part of

Spoons, Forks, Table Cutlery, Dinner, Tea and Dessert Sets, Entre Dishes, Epergnes, Castors, Cake Baskets, Ice-Water Sets, Tea and Coffee Urns, Salvers, Communion Ware, &c.

Centennial Medals and Diplomas were Awarded to this Company for "Superior" Silver-Plated Ware.

Extract from Centennial Judges' Report.—"Their large variety of Silver-Plated White Metal Hollow Ware is of excellent quality and finish, and of tasteful designs."
"Their Silver-Plated Forks, Spoons and Knives are of superior quality and excellent finish. Their XII Plating, or extra plating on exposed parts, deserves commendation."

Extract from American Institute Report.—"Their Porcelain Lined, Double-Walled Ice Pitchers are **A 1**, and possess ALL the qualities the company claim."
"We consider the goods made by this company to be by far THE BEST made in this country, and we believe in the world."



THE PORCELAIN-LINED ICE-PITCHERS, ANOTHER SPECIALTY.—Valued for retaining the Purity and Coolness of Water, as well as for Durability, Cleanliness and Chemical Excellence of their Interior Surface. The Porcelain is Enameled on Hard Metal and cannot be broken or cracked by rough usage.

"There are many apparent advantages in these linings, besides those already mentioned, BUT THE ABSENCE OF ANY INJURIOUS MATERIAL in the construction of this inner chamber SHOULD BE THE FIRST CONSIDERATION IN SELECTING A SAFE ICE PITCHER FOR DAILY USE."—S. DANA HAYES, M. D., State Assayer of Massachusetts.

We take much pleasure in referring to the reputation we have for many years maintained for manufacturing SPOONS AND FORKS BEARING THE TRADE MARK, "1847, ROGERS BROS."

Particular attention is invited to our Patented Process of Electro-Plating Spoons and Forks, by which the parts most exposed to wear receive an EXTRA COAT OF SILVER. This feature renders these goods more economical and durable than those of any other manufacture, while the increased cost is relatively small. This method of plating we apply to the 4, 8 and 12 oz. plate, as required.

☞ **First Premiums** Awarded at all Fairs where Exhibited, from the World's Fair, 1853, to American Institute Fairs, 1873, 1874 and 1875, inclusive, and at the Philadelphia Centennial Exhibition, 1876.

Manufactories, West Meriden, Conn. **WAREROOMS, UNION SQUARE, NEW YORK.**

SUPERIOR ELECTRO-PLATE!

MANUFACTURED BY

THE MIDDLETOWN PLATE COMP'Y,

Factories, MIDDLETOWN, Conn.

Salesrooms, { 13 John Street, New York.
120 Sutter Street, San Francisco.

SUPERIOR HARD WHITE METAL,

SUPERIOR HEAVY PLATE,

SUPERIOR DESIGNS, WORKS OF ART

Wedding and Fancy Presentation Pieces in Elegant Designs.

Our assortment of Tea Sets, Urns, Butter Dishes, Syrup Cups, Baskets, Pitchers, Waiters, Goblets, Fruit and Berry Dishes is complete in **new designs.**

Our Patterns are Original! **Photographs sent dealers on application!**

SIMPSON, HALL, MILLER & CO.

Fine Electro-Silver Plated Ware,

Factories, Wallingford, Conn. Salesroom, No. 676 Broadway, N. Y.

One of the oldest and most reliable manufactories in the country.

Our Solid Table Ware is made of the Best Nickel Silver.

Spoons, Forks, Ladles, Pie Knives, &c.

IN GREAT VARIETY OF PATTERNS.

Solid Steel Knives, superior article and Heavily Plated for Service.



OUR HOLLOW WARE consists of Tea Sets, Urns, Tea Trays, Spoon Holders, Milk and Water Pitchers, Butter Dishes with glass plates, Cake Baskets, Biscuit Bowls, Berry Dishes, Fruit Stands, Pickle and Jelly Dishes, Dinner and Breakfast Castors, Oyster and Soup Tureens, Baking Dishes, Steak Dishes, Vegetable Dishes, Celery and Salad Dishes, Syrup Cups, Tray and Rack for holding Spoons and Forks, also with Call Bell attached (patented). Toilet Sets in great variety of patterns, beautiful glass, richly mounted with silver, Vases, Card Stands combined. The glass Vases are of various patterns and styles; cut and fancy, of the most beautiful designs and mounted in the most elegant silver frames and stands. Centre Pieces and Epergnes, the most elaborate or plain, as desired; in fact thousands of articles in the line of Silverware, and all warranted to be first-class and exactly as represented.

☞ Our facilities being second to none to produce the finest and most serviceable *ELECTRO-PLATED WARE*, at the lowest possible price. By years of experience, close attention to business, and our unsurpassed facilities, we are enabled to produce goods as cheap, if not cheaper, than any other concern in this country, consequently dealers can feel assured that they will always get goods from us at the very lowest price. The pride of our house is to make the finest goods, and sell them at fair prices, and please our customers, by honorable dealings, and retain the reputation which, we believe, is unquestioned as to our making the best of goods and also the cheapest.

PATENT BUTTER DISH.

We have introduced this season an entirely new and novel Butter Dish. The convenience of its opening and closing can but strike one favorably. Its beauty of design and workmanship must please everybody. We have produced other valuable designs and patents in the way of Butter Dishes as well as many other useful articles in our line, but this is the most complete and perfect in its arrangement of anything heretofore produced, and must take the lead of all other first-class Butter Dishes in the market.

DAVID F. CONOVER & CO.,

(SUCCESSORS TO WM. B. WARNE & CO.)

Importers, Manufacturers and Wholesale Dealers in

WATCHES AND JEWELRY.

Silver and Silver-Plated Ware,

AMERICAN WATCH WHOLESALE SALESROOM,

Southeast Corner Chestnut and 7th Sts.,

(FIRST FLOOR.)

DAVID F. CONOVER,
B. FRANK WILLIAMS,
C. EDGAR RIGHTER.

PHILADELPHIA, PA.

JAS. BOSS' PATENT STIFFENED



Gold Watch Cases

ARE MADE TO FIT ALL GRADES OF

American Movements.

The Manufacturers call the special attention of the Trade to their unequalled facilities for promptly filling orders for Cases for odd Movements, and the

NEW

Model Waltham Watches



HAGSTOZ & THORPE,

PHILADELPHIA, PA.

New York Office, 13 John Street.

Paris Exposition, Location C. 2.

GORHAM MANUFACTURING CO.

SILVERSMITHS,

NEW YORK AND PROVIDENCE.

Manufacturers of Sterling Silverwares of the highest character and in all branches of the art. Also makers and sole Proprietors of the GORHAM PLATED WARES, so well and favorably known to all dealers. In Silver Goods our stock is unusually complete and attractive, embracing an extensive assortment of Silver Hollow Ware, of exquisite design and finish, comprising large single pieces for presentation purposes, and complete services in Tea, Dinner and Dessert Ware, etc., and from which we can supply *immediately* any demand by *mail* or *telegraph*.

Dealers availing themselves of these advantages are enabled to offer customers a select display of goods, which often results in large sales. We would call attention to our lithographic circular on another page of this Journal, containing two of our latest designs in Spoons and Forks. Each of these patterns has artistic merits that especially recommend them to the best class of trade.

ILLUSTRATED CIRCULARS, showing our complete line of Spoon Patterns, together with price and weight list, will be sent to the Trade *only*, upon application. We are now making the largest line of successful patterns of spoons and forks on the market, and our business in these goods, for the past season, has exceeded that of any previous year. All Solid Silver Goods of our manufacture are GUARANTEED absolutely to be of the English Standard, $\frac{925}{1000}$ fine.

GORHAM PLATED WARE.

This well known ware has been on this market for thirteen years, and has won an abiding reputation as the Standard ware of this City. These goods are made of Hard Metal, *Silver Soldered throughout*, and very heavily plated, and is a durable and elegant substitute for Solid Silver. Our object is to produce the *BEST ARTICLE* made in Plated Ware, the cost of production being a secondary consideration. We are enabled to make considerable reductions from former prices. We offer these Wares to the Trade as the most durable and economical Plated Ware made.

Photographs and Prices Furnished.

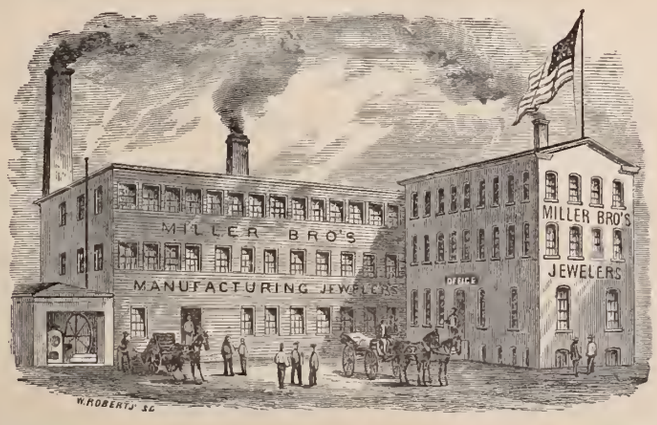
MILLER BRO'S,

MANUFACTURING JEWELERS,

No. 11 MAIDEN LANE, NEW YORK.

Manufactory, 47, 49 & 51 Franklin Street, Newark, N. J.

INITIAL GOODS



A SPECIALTY!

Seals, Lockets, Sets, Sleeve Buttons, Studs, Collar and Chemise Buttons.

ATTENTION IS INVITED TO OUR

NEW STYLES OF ETRUSCAN SLEEVE BUTTONS,

MOUNTED WITH

RUSTIC LETTERS,

BIRDS, ANIMAL HEADS AND FANCY ORNAMENTATIONS.

Sussfeld, Lorsch & Co.,

IMPORTERS OF

Optical and Mathematical Instruments,

Watchmakers' Tools, Materials, Watch Glasses, &c.

No. 13 Maiden Lane, New York.

Sole Depot in the United States for
BARDOU & SON'S
Universal Opera Glasses,
U. S. ARMY & NAVY SIGNAL GLASSES,
&c., &c.

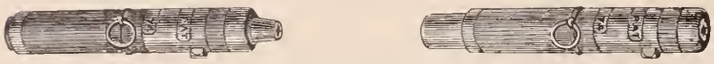
G B
TRADE MARK.

Sole Depot in the United States for the
CELEBRATED
Crown Spectacles and Eye Glasses,
OF ALL GRADES.

TRADE MARK

Commission Merchants at 27 Rue de Paradis, Poissonniere, Paris.

NORCROSS PATENT DUST-PROOF KEY.



KEY OPEN. Patented July 14th, 1874. KEY CLOSED.

This Key is preferred to all others, as there is no possibility of dust accumulating in the pipe. It will not break or wear like other Keys, being made of Stub's steel, hardened and tempered.

CLEMENS OSKAMP,

Manufacturing Jeweler,

And SILVERSMITH,

IMPORTER & WHOLESALE DEALER IN WATCHES,

CLOCKS, MATERIALS & OPTICAL GOODS.

No. 175 Vine Street,

CINCINNATI.

TRADE MARK

Wm. C. Greene & Co

GOLDSMITHS

MANUFACTURERS of
RICH SETS IN TAPER WIRE CORAL

&c.
EAR Drops
Studs Crosses
Sleeve Buttons
Brooches
Enamel Sets
Engraved &
Coral Cameo
Amethyst
Stone Cameo

Factory
95 PINE ST.
Providence, R. I.

NEW YORK OFFICE, No. 192 BROADWAY.

WM. C. GREENE. B. W. GREENE. GEO. D. BRIGGS.

J. B. & S. M. KNOWLES,

MANUFACTURERS OF

Sterling Silverware

Office, No. 20 MAIDEN LANE,

NEW YORK.

Factory, No. 95 PINE STREET, PROVIDENCE, R. I.

Greason, Bogart & Pierce,

Successors to Arthur, Rumrill & Co.

MANUFACTURERS OF GOLD CHAINS,

AND

FINE ETRUSCAN JEWELRY,

Nos. 182 and 184 BROADWAY,

New York.

AMASA BRAINERD, JOHN W. STEELE, DYER BRAINERD.

BRAINERD, STEELE & CO.,

MANUFACTURERS OF

Brainerd's Pat. Lockets,



(Patented June 17, 1874.)

These Lockets combine both beauty and strength. They are made of solid 14kt. gold, and the stones used are the finest obtainable in the market. They cost no more than those of the old style, if indeed as much; and the combination of secrecy and durability renders them much more desirable. We make three sizes in four different shapes—round, oval, cushion and oblong square; and also Sleeve Buttons of the same style, containing a concealed box for miniatures, a novelty new to the Trade.



FINE GOLD JEWELRY,

No. 9 Maiden Lane,

NEW YORK.

ESTABLISHED 1837.

VICTOR BISHOP & CO.,

IMPORTERS OF

Diamonds, Precious Stones, Mosaics, Cameos

CORAL JEWELRY,

Imitation Stones, Roman Pearls.

FINE FRENCH BEADS,

Of all Colors, in Strings and Necklaces.

Diamond Scales, Gold Shells, Silver and Copper Foil, &c.

Enamel of all colors and quality; also Platinum and Copper.

No. 47 NASSAU STREET, NEW YORK.

House in Paris, 66 Boulevard de Sebastopol.

ESTABLISHED 1847.

J. T. SCOTT & CO.

Importers of Watches,

MANUFACTURERS OF JEWELRY,

—AND—

Jobbers in all grades of American Movements,

GOLD AND SILVER CASES.

Gold Chains, Jewelry, Diamonds, Clocks, Silverware, &c.

No. 11 Maiden Lane, New York.

☞Prompt and careful attention given to filling orders for all kinds of goods pertaining to the trade. Goods sent on approval when satisfactory references are furnished.

☞ Designs and estimates given, and special attention paid to orders from jewelers for Watches, Badges, etc., desired for presentations

☞Price List of American Watches, &c., sent only to regularly established dealers.

SAXTON, SMITH & CO.

MANUFACTURERS OF

Fine Gold Chain.

No. 194 BROADWAY,

New York.

Factory, No. 183 Eddy Street, Providence, R. I.

☞ **Sole Agents for the new PATENTED CHAIN BAR, containing a Detachable Pencil.**

WOOD & HUGHES,

STERLING

Silverware Manufacturers

No. 16 JOHN STREET,

NEW YORK.

H. HOWARD. A. NICOUD. A. J. SCHERRIEBLE.

H. HOWARD & CO.

Manufacturing Jewelers,

No. 14 JOHN STREET, New York.

Factory, 102 Orange Street, Providence, R. I.

NOVELTIES IN STOCK PLATE A SPECIALTY.

Geo. Krementz. J. A. Lebkuecher.

KREMENTZ & CO.,

Manufacturing Jewelers,

No. 13 John Street,

Factory, 361 MULBERRY ST., Newark, N. J.

NEW YORK.

TRADE  MARK.

WHITING M'F'G COMPANY,
STERLING
SILVERSMITHS,
WORKS & WAREROOMS,
Broadway & Fourth St., New York.
WHOLESALE ONLY.

SMITH, HEDGES & CO.
IMPORTERS OF
DIAMONDS
Which are offered to the Trade, mounted or unmounted.
No. 1 Maiden Lane, cor. Broadway,
NEW YORK.

CARTER, HOWKINS & SLOAN,
Makers of
FINE JEWELRY,
Consisting of Chains, Bracelets, Sets, Pins, Studs, Sleeve Buttons, Rings, &c., in Roman, Etruscan and Enamel.
Whiting Building, Corner Broadway and Fourth Street,
A. CARTER JR.
WM. HOWKINS,
A. K. SLOAN.
NEW YORK.
C. E. HASTINGS,
GEO. R. HOWE,
W. T. CARTER.

Established 1817.
Ve. J. MAGNIN, GUÉDIN & CO.
Manufacturers and Importers,
FINE SWISS WATCHES,
REPEATERS, CHRONOGRAPHS & CALENDARS.
GENEVA GOLD JEWELRY,
FRENCH CLOCKS AND BRONZES,
RICH FANCY GOODS,
HORSE-TIMERS & PODOMETERS,
GOLD AND SILVER CHATELAINE WATCHES.
No. 652 BROADWAY, NEW YORK.
Sole Agents for the James Nardin Watch.
House in Geneva, 14 Grand Quai.

HALE & MULFORD,
MANUFACTURERS OF
RICH JEWELRY,
(WHITING BUILDING),
No. 694 Broadway, corner 4th Street,
NEW YORK.
Stone and Stone Cameo Goods, Rings, Necklaces, Colored and Etruscan Work, Etc.
FIRST CLASS GOODS OF OUR OWN MAKE
EXCLUSIVELY!

BALDWIN, SEXTON & PETERSON
MANUFACTURERS OF
Fine Jewelry,
Diamond and Stone Cameo Goods,
GOLD CHAINS, &c.
Importers of Diamonds, Pearls, Emeralds, Rubies, &c.
WHITING BUILDING,
Cor. Broadway and Fourth Street,
NEW YORK.

THE

ADAMS & SHAW COMPANY,

SILVERSMITHS,

694 BROADWAY, - - - - - NEW YORK.

The managers of this company are men personally well acquainted with the best products in silver of Europe and America, and, from their knowledge and long experience, are able to manufacture for the trade articles of the highest excellence

Besides making in all their variety the wares of general use, in the best style and at lowest current rates, the company turns its attention to Gifts, Prize Cups, Testimonials, Church Services and other occasional objects, and will furnish designs and estimates for the same. The most admired forms in Antique, Mediæval and last century art are reproduced.

The Spoon and Fork patterns of this company are conceded to be the most successful in the market.

ELECTRO PLATE.

The Adams & Shaw Company also make the very finest Hard Metal, Silver-Soldered Plated Ware. They were the first to discard entirely the use of Soft Solder in soldering the joints, mounts, etc., and no such weak spot or defect can be found in any piece of ware ever made by them. They received the highest award, Medal and Diploma, at the Centennial Exhibition for Hard Metal, Silver-Soldered Electro Plate.

WHEELER, PARSONS & HAYES,

MANUFACTURERS OF

Watch Cases, Gold Chains & Fine Jewelry,

AND DEALERS IN

AMERICAN AND SWISS WATCHES,

NO. 2 MAIDEN LANE, NEW YORK.

ENOS RICHARDSON & CO.

MANUFACTURERS OF

FINE GOLD JEWELRY,

Gold Chains, Lockets, Crosses and Necklaces,

COLORED AND ETRUSCAN WORK.

All Goods sold strictly of our own manufacture.

23 MAIDEN LANE, NEW YORK.

ENOS RICHARDSON, L. P. BROWN, F. H. RICHARDSON,
THOS. SLATER, W. P. MELCHER.

ONYX GOODS A SPECIALTY!

JOHN A. RILEY & CO.,

Manufacturing Jewelers,

ETRUSCAN GOLD AND CORAL SETS, ROMAN BRACELETS, NECKLACES, &C.

Nos. 7 and 9 BOND STREET

NEW YORK.

No. 126 Kearny Street, San Francisco, Cal.

Established 1813.

THOMAS G. BROWN,

MANUFACTURER OF

FINE JEWELRY,

NEWARK, N. J.

—AND—

9 BOND STREET, NEW YORK.



Nº 24 DOELEN STRAAT AMSTERDAM, HOLLAND.
Nº 1 GAERTNER PLATZ MUNICH, GERMANY.

Diamonds loose and mounted sent on approval on receipt of satisfactory reference.

Joseph B. Bowden & Co.

MANUFACTURING JEWELERS,

SOLID GOLD RINGS

A SPECIALTY.

A LARGE ASSORTMENT OF PLAIN, CARVED, PLAIN BAND AND CHILDRENS' ALWAYS ON HAND. ALSO A FULL LINE OF CAMEO SLEEVE BUTTONS AND STONE RINGS.

Old No. 11 Maiden Lane, New York.

CARROW, CROTHERS & CO.,

MANUFACTURERS OF

FINE JEWELRY,

No. 12 John Street, New York.

Specialties!

FINE LINKED SLEEVE BUTTONS, ROMAN BAND BRACELETS, LOCKETS & CROSSES.

N. B.—We desire to call the attention of the Trade to our IMPROVED BRACELET CATCH, and our new styles of Link Sleeve Buttons.

Established 1846.

WILLIAM RIKER,

No. 5 Maiden Lane, New York.

Factory, 42 Court Street, Newark N. J.

CHATELLIER & SPENCE,

Manufacturing Jewelers,

652 BROADWAY, NEW YORK.

No. 1129 Chestnut Street, PHILADELPHIA, PA.

No. 12 West Street, BOSTON, MASS.

No. 120 Sutter Street, SAN FRANCISCO, CAL.

CHATTERTON & DODD,

Makers of Fine Jewelry

Consisting of Sets, Pins, Ear-Rings, Lockets, Crosses, Sleeve Buttons, Studs, &c.

No. 19 John Street, New York.

ROMAN, ETRUSCAN AND ENAMEL WORK GENERALLY, SPECIALLY DESIGNED BY US.

COE, PINNEO & STEVENS,

MANUFACTURERS OF

LOCKETS,

WHITE ENAMEL STUDS & BUTTONS,

Linen Finished and

FINE JEWELRY,

Old No. 9 Maiden Lane, New York.

ESTABLISHED 1859.

RINGS A SPECIALTY.

BRYANT & BENTLEY,

No. 12 Maiden Lane, New York.

MANUFACTURE A LARGE VARIETY OF

FINE SOLID RINGS,

For Ladies and Gentlemen, in CAMEO, AMETHYST, ONYX, TOPAZ, TURQUOISE, GARNET and other stones, Fine CAMEO, CORAL and ROMAN SETS of new and handsome designs. LOCKETS, MEDALLIONS, SHAWL and SCARF PINS, SLEEVE BUTTONS, STUDS, &c. All goods warranted.

☞ We continue to manufacture several hundred patterns of **HARD SOLDER RINGS**, in every style, for men, women and children, stamped and warranted 16 carat fine.

J. EUGENE ROBERT,

IMPORTER OF WATCHES, No. 30 Maiden Lane, N. Y.

Sole Agent for { LONGINES WATCH COMPANY. "AGASSIZ" LADIES' STEM-WINDERS. Louis Audemars' Fine and Complicated Watches.

LONGINES NICKEL METAL STEM-WINDERS of various sizes and styles, pronounced unsurpassed for quality, durability and price.

Extract from M. Favre Perret's Report to Federal Council of Switzerland on Centennial Exhibits.

The LONGINES WATCH Co., merits a special mention. It was the first to properly estimate the importance and put in execution the system of manufacturing watches *altogether* by machinery, thereby obtaining regularity and steadiness of work. By adopting all latest improvements and with its complete stock of tools, we are convinced that they will produce a most thorough timepiece, faultless in solidity and construction, and the parts of which will in reality be interchangeable. In Switzerland this establishment is the Pioneer factory of entirely machine-made watches. Its reputation, well earned, has spread not only in the United States, but also in all the principal commercial centers of the globe."

Will Remove May 1st to 30 Maiden Lane.

E. J. DERAISMES H. A. DERAISMES.

DERAISMES BROTHERS,

Successors to L. A. LUTZ & LUTZ BROTHERS,

MANUFACTURERS AND IMPORTERS OF THE

LUTZ BROTHERS, L. A. LUTZ, PERRET & CO., And A. HUGUENIN-NARDIN

WATCHES.

Fine Movements a SPECIALTY. ¼ seconds, Chronographs and Extra Fine Silver Watches always in Stock. Goods sent on approval, satisfactory N.Y. City references being furnished.

No. 182 BROADWAY,

P. O. 2639, NEW YORK.

FACTORY, Rue des Envers, Locle, Switzerland.

BOREL & COURVOISIER TO THE FRONT!

SWISS WATCHES

AGAIN RANK AS THE BEST.

IMPROVED MACHINERY HAS DONE THE WORK.

☞We are happy to inform our agents and patrons that the **new B & C.** are now ready. ALL ORDERS CAN BE FILLED AT ONCE! We are authorized to make a considerable reduction from former prices, in order to place them within the reach of all.

☞**Dealers wishing to act as authorized agents for the sale of these celebrated Watches and Movements will be furnished with full particulars by addressing, with business card,**

QUINCHE & KRUGLER,

No. 17 MAIDEN LANE, NEW YORK.

Sole Agents in the United States.

HENRY GINNEL,

Importer of Swiss Watches,

TOOLS AND MATERIALS, SILK GUARDS, &c.

And Jobber in all grades of American Watches.

No. 31 MAIDEN LANE,

P. O. Box 2967. NEW YORK.

In addition to our line of **SWISS KEY AND STEM-WINDING WATCHES, and Materials of all kinds,** we have a large stock of the celebrated **PIONEER Stem-Winding and Stem-Setting Watches** (manufactured expressly for us) and pronounced by competent workmen to be the best watch for the money in the market. They are cased in silver and German silver hunting or opened faced. **Send for Prices.**

Full Trade Discounts on American Watches.

MATHEZ

Watch Company,

Of NEW YORK.

Gents' and Ladies' Stem-Winding Movements

STRAIGHT LINE, 3-4 PLATE NICKEL.

These Movements are of six different grades, uniform in size and beautifully finished, and will be SOLD AT LOWER PRICES than any other goods of similar excellence.

☞A FULL LINE of materials for our movements always kept in stock for the convenience of those using our goods.

F. H. MATHEZ, Sole Agent,

No. 5 Maiden Lane, New York.

ESTABLISHED 1845.

SALTZMAN & CO.

MANUFACTURERS AND IMPORTERS OF

Fine Swiss Watches



SOLE IMPORTERS OF THE

AUGUSTE SALTZMAN
VICTOR VUILLAUME
ALBERT VUILLE
} Watches

SPECIAL NOTICE.

The Trade is respectfully notified to beware of imitations of the name of Saltzman, marked on Watches of an inferior grade, and purporting to be the genuine Saltzman.

No. 15 Maiden Lane, New York.

J. A. BROWN & CO.

OFFICE AND SALEROOM: No. 11 Maiden Lane, N. Y.
FACTORY: No. 104 Eddy St., Providence. R. I.

SOLE MANUFACTURERS OF THE

Ladd Patent Stiffened Gold Watch Cases



For the Movements of the various American Watch Co.'s, Gent's, Ladies' and Boys' sizes, Key and Stem-Winders, and in the following styles, BASCINE, FLAT-BEVEL and MANSARD, (this latter as originally named, modeled and introduced by them) forming the most complete and varied line of elegant Cases ever offered for sale. It is now eleven years since these Watch Cases were introduced to the public, during which period of time they have steadily gained in popular confidence and esteem. Made of thick plates of Gold and Nickel Composition, this Composition is harder and tougher than any other metal except the gold itself, and suggested the term STIFFENED, originally used by us to designate this important improvement; no other case in the world is made like it; thoroughly welded together and rolled to the required thickness—they are, while equally handsome—stronger and more durable than the finest Solid Gold Cases of the same thickness of metal, and at ONE-THIRD or ONE-HALF the COST, and with good movements, they make the cheapest, most elegant and serviceable Watches in the market. The critical examination of these goods by the trade and public is invited.

FOR SALE BY JEWELERS GENERALLY.

☞Dealers can obtain them of the Wholesale Watch and Jewelry Houses, or their Traveling Agents, throughout the United States and British Provinces.

☞All genuine Watch Cases of our manufacture, have "G. W. Ladd's Patent, June 11th, 1867," stamped upon the side band underneath the glass bezel.

Refuse all others. Send for full Descriptive Circular.

NATHAN E. MORGAN. CHAS. B. HEADLY.

MORGAN & HEADLY,

MANUFACTURERS OF

GOLD SPECTACLES,

FINE JEWELRY, CHAINS, BRACELETS,

18 Karat Plain Rings, &c.

Artisan Hall, 611 & 613 Sansom Street,

PHILADELPHIA.

☞A full line of *DIAMONDS,* mounted and unmounted, always on hand, which we will send on approval to the Trade, on receipt of reference.

ARTISTIC BRONZES,
ANTIQUE CANDLESTICKS,
MANTEL AND TABLE ORNAMENTS,
CARD STANDS, SCONCES.

ARCHER & PANCOAST M'F'G CO.,

67 GREENE STREET,
68, 70, 72 WOOSTER STREET,
NEW YORK.

LOUIS A. SCHERR. CHAS. H. O'BRYON. G. W. SCHERR.

LOUIS A. SCHERR & CO.

Importers and Wholesale Dealers in

Watches, Jewelry,

WATCH MATERIALS, TOOLS, GLASSES, &C.

Spectacles, Silk Guards, &c.

Wholesale Agents for American Watches.

No. 726 CHESTNUT STREET,

FIRST FLOOR,

PHILADELPHIA.

Ripley, Howland & Co.



MAKERS OF

FINE JEWELRY.



Would respectfully call attention to their patent PLATINUM TIPPED Settings for Diamonds (just introduced), an advantage dealers will readily appreciate, as the stone is held, not by yellow, but by scarcely perceptible *white* points which are equally strong and more durable than gold.

These *white* points impart an elegant appearance to the gem and relieve the setting of that coarse and unattractive look usually found in those entirely composed of silver or platinum.

PATENTED APRIL 16th, 1878.

NO. 35 MAIDEN LANE, NEW YORK.

FACTORY, 383 WASHINGTON STREET, BOSTON, MASS.

Dorrance, Edge & Co.

MANUFACTURERS OF

THE CELEBRATED WOVEN FABRIC

GOLD CHAIN.

Elegantly Mounted Bracelets, Opera, Leontine,

VICTORIA WATCH GUARDS & NECKLACES, in all the Newest Designs.

☞Our stock is unusually complete, and, in addition to the above, a variety of **Necklaces,** from 1½ to 40 dwt. each, to which we invite the attention of buyers.

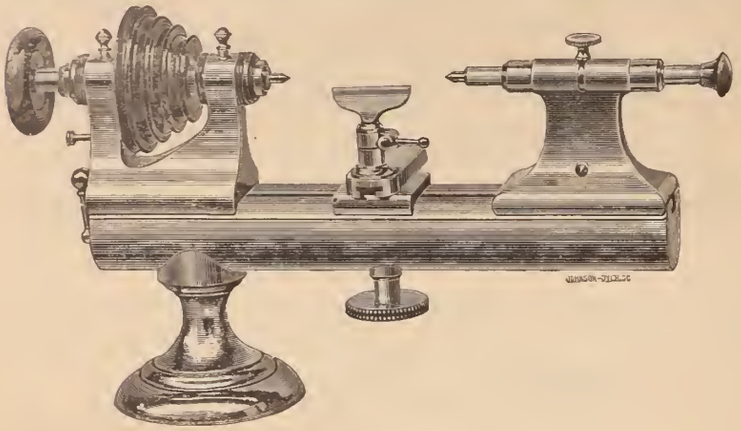
No. 9 John Street, New York.

Factory, 46 Greene Street, Newark, N. J.

American Watch Tool Co.

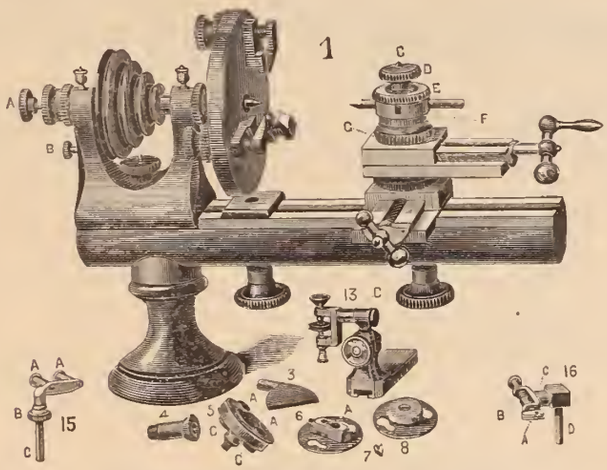
Formerly J. E. Whitcomb & Co.

Manufacturers of Watch & Chronometer Makers' Tools.



P. O. Box 999. WALTHAM, MASS

HOPKINS' WATCH TOOL CO.



Manufacturers of **HOPKINS' PATENT WATCHMAKERS' TOOLS**, embracing Plain and Combination Lathes, Chucks, Slide and Swing Rests, Gear Cutters, Pivot Polishers, Jeweling and Staking Tools, &c.
Illustrated circulars sent on application.
HOPKINS' WATCH TOOL CO., Waltham, Mass.

Medal and Diploma of Merit
Awarded by Centennial Com.

S. C. JACKSON,

MANUFACTURER OF FINE

CASES

For Jewelry, Silver Ware, Trays, &c.

180

BROADWAY,

NEW YORK.



Notice to the Trade.



The above cut represents our Trade Mark of the **"Centennial Watch,"** of which we are the sole manufacturers. We deem it proper to caution the Trade against imitations of it by unscrupulous parties who are endeavoring to palm off inferior goods advertised as "Centennial Watches." We shall take legal steps to have it stopped, and shall prosecute all infringements of our rights in the premises.

Cross & Beguelin,

No. 21 Maiden Lane, New York.



Fac-simile of the "Centennial Watch."

TELL A. BEGUELIN,

(Successor to the late Ginnel & Bro.)

Importer of Watches

WATCH MATERIALS, TOOLS AND GLASSES,

No. 71 NASSAU STREET,

(UP STAIRS),

CORNER JOHN STREET **NEW YORK.**

Sole Importer of the TELL A. BEGUELIN'S BEST MAINSPRINGS.

☞Every description of Watches carefully repaired for the Trade.



REMOVED TO No. 658 BROADWAY.

EDWARD TODD & CO.

MANUFACTURERS OF

GOLD PENS,



Pencil Cases, Tooth Picks, &c.

No. 652 BROADWAY,

Factory, 29 & 31 South 11th St., Brooklyn. **NEW YORK.**

C. F. A. HINRICHS,

29, 31 and 33 PARK PLACE,

Cor. of CHURCH STREET, (Up-stairs) NEW YORK

Successor to M. WERCKMEISTER.

[ESTABLISHED 1801.]

IMPORTER AND DEALER IN

FANCY GOODS,

GLASS-WARE,

China, Bronzes, Clocks, Toys, &c.

Sole Agents for the Glass Factories of the Company "ANN," Namuroise, Belgium

Depot for Archery, Cricket & Base Ball Implements.

And C. A. KLEEMANN'S CELEBRATED GERMAN STUDY LAMPS

Agent for **ROGER'S GROUPS** in Parian, &c.

ESTABLISHED 1855.

WELCH & MILLER,

MOROCCO, VELVET AND SATIN

JEWELRY CASE MANUFACTURERS.

☞Show Case Trays in Black Walnut and Rosewood.

Velvet Cases for Diamonds a Specialty.

No. 169 BROADWAY, NEW YORK.

CATALOGUES SENT ON APPLICATION.



In placing these Oils before the Trade, we do so with entire confidence, from many years' experience in procuring them from the fish, and in their preparation for use, and more than all, the thorough and SEVERE TESTS they have been subjected to in use upon Chronometers in our whale ships, often absent from fifty or sixty months. ☞Liberal samples furnished on application.

ROSKOPF WATCH.

J. D. HUGUENIN & CO.,

GENERAL AGENTS,

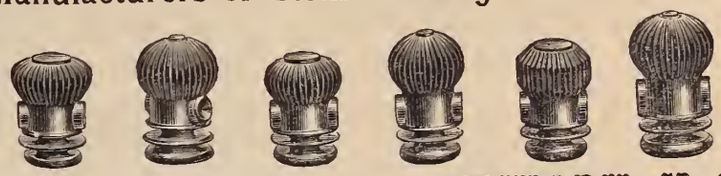
No. 12 Maiden Lane, New York.

The reputation of this Watch as an accurate timekeeper is fully established, and during the ten years that it has been before the Trade, has won an abiding reputation for fine Time-keeping qualities, and the BEST WATCH for the money in the world.

☞Send business card for price list.

MILNE & JOURDAIN,

Manufacturers of Stem-Winding Watch Crowns



13 & 15 Franklin Street, NEWARK, N. J.

Gold Crowns, for Stem-winding Movements, to suit all sizes of Imported or American Watches, in four different styles and seven sizes.

Gold Pushers for Key Movements in every size. Also Gold Crowns for fine Chronograph Watches made to order.

☞Silver Stem winding Crowns and Key Pushers on hand or made to order. Send for card and samples.

A. MILNE. A. JOURDAIN.

D. LIECHTY, B. LEVY.

D. LIECHTY & CO.

MANUFACTURERS OF

Gold & Silver Watch Cases,

IMPORTERS AND DEALERS IN

SWISS & AMERICAN WATCHES,

No. 402 Library Street,

PHILADELPHIA.

Lubricating Oils, for Watch, Clock and Chronometer Makers.

The di-covery of a Lubricator for FINE MACHINERY, such as Watches, Clocks and Chronometers, that is free from gum and corrosive substances, has taxed the ingenuity of hundreds of men whose efforts have proved a failure. But we are happy to say (being largely interested) that such an article has been supplied by MR. EZRA KELLEY, of New Bedford, Mass., who, after forty years study of the subject, has perfected a Lubricator that recomends itself to all who have used the *genuine*, (there having been numerous counterfeits in the market) as witness also the award of a Diploma and Medal by the judges of the late Centennial Exhibition at Philadelphia. We have no hesitation in saying that his Oils are the BEST manufactured, always uniform in quality and capable of standing all tests applied to lubricating oils. We cheerfully recommend it to all who may in their business require a FIRST-CLASS LUBRICATOR







AMERICAN CLOCK CO., (Hine & Thomas.)

P. S.—The above Oils can be procured at all first-class wholesale Watch and Clock Establishments in the United States, as well as his only Agents, GRIMSHAW & BAXTER, 75 Goswell Street, London England.

New Bedford, October 15, 1877.

American Watch Company.

NEW YORK, MAY 1, 1878.

We desire to state that, with a view to improving our Full Plate grades of Movements, we have entirely remodeled them, with the following special advantages:

1st, The barrel does not project beyond the top plate, thus allowing a plain, tighter-fitting dust band to be used.

2d, The pottance is immovably fixed in the plate, and need never be disturbed. With this pottance so placed it is impossible for the balance to get out of upright, and it is a convenience for repairers. This valuable improvement is secured by patent.

3d, The angles of the pallet jewels, on both sides of the pallet, are the same, and the jewels are interchangeable, which is also convenient for repairers. By this means the whole escapemeat has been improved.

4th, An improved arrangement for letting down the mainspring without taking off the hands and dial. The barrel can be removed by simply taking off the barrel bridge.

5th, All, excepting the "Broadway" and "Sterling" grades, will have machine made conical pivot balance staffs—a great improvement on the hand-made. We shall be ready to put them in the "P. S Bartlett" some time this month, and in the "Ellery" in June.

6th, All the top plate jewels are in settings except in the "Ellery" grade.

7th, The "A., T. & Co." grade is adjusted to heat and cold by new and improved methods.

8th, All grades, including "Broadway" and "Sterling" are warranted.

9th, The Stem-Winding and Setting Attachment is simpler, very convenient and more durable.

10th, The dials are firmly secured by screws.

11th, The hair-spring stud is in the cock, so that balance and cock can be taken off and replaced without danger of changing the rate of the watch.

12th, All the wheels and pinions run in the solid plate in jewels or otherwise, the third bridge being abandoned, so that no part of the train can get out of upright.

13th, Balances have mean-time screws—a great advantage in timing and poising when the watch needs repairing.

Finally, the general appearance is much improved by the design and finish of the watch. This is seen at once by comparison with the old models.

Particulars as to prices, etc., will be found on the 4th and 5th pages of our Price List, which will be forwarded on application.

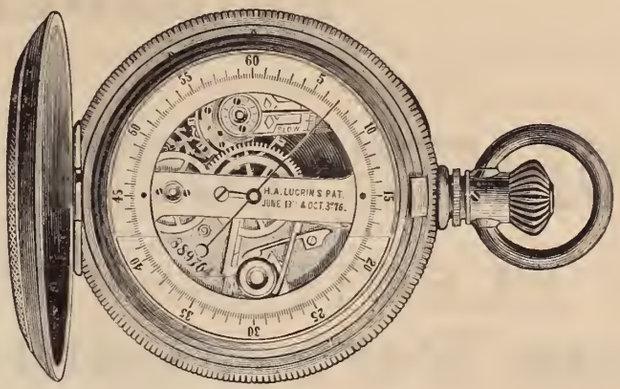
ROBBINS & APPLETON, General Agents,

No. 9 BOND STREET, NEW YORK.

178 State Street, Chicago. 8 Summer Street, Boston. Waltham Building, London.



Front view of Watch,
Showing regular Time Dial.



Back view of Watch,
Showing Chronograph.

DEAR SIR:

The above is a cut of the WALTHAM WATCH with CHRONOGRAPH ATTACHMENT. This is attached to our 14th Size, (Gents') Stem-Winding and Stem Setting movement, either gilded or nickel. The Chronograph beats fifth of seconds, and is a fly-back, which works either from the stem or outside push piece, as may be desired.

We claim an advantage over the imported in this respect: it is applied to the back of the watch, thereby using a separate and independent dial, and not complicating the regular time dial as do the Swiss and all other imported Chronographs.

It is also very simple in construction, and in case of accident we can always supply duplicate parts which will not require fitting.

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These Watches can be obtained from your local jeweler. If he has none in his stock, we can supply him at his request.

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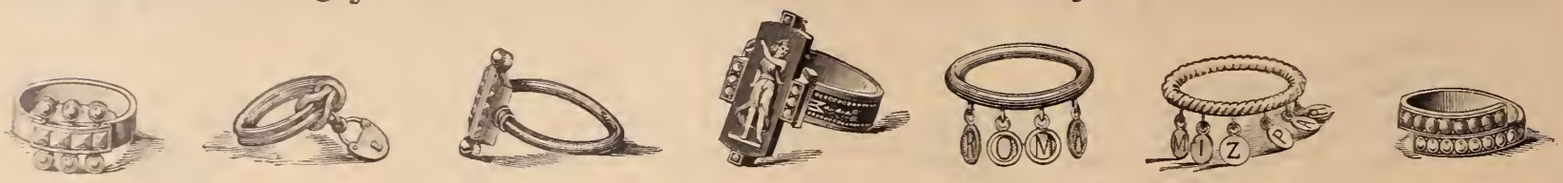
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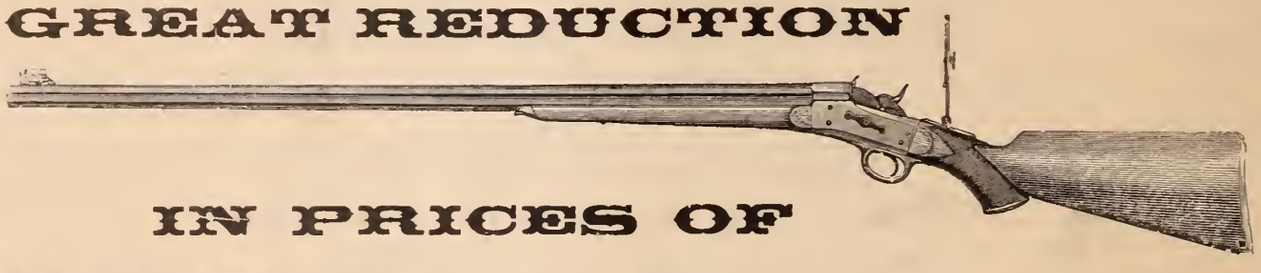


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The particular design of the League is to contribute to and collect a fund, to be paid to the heirs of deceased members. Any man of good moral character and good general health, not over forty-five or under twenty-one years of age, who is in the Jewelry or kindred business, in the United States, is eligible to membership, whether proprietor, salesman, watchmaker, workman, or in whatever capacity he may be engaged.

All applications for membership must be accompanied by THREE DOLLARS as an initiation fee, and two dollars for first assessment.

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The League being formed for mutual benefit, and not for profit to any individual member, there are no salaries or fees paid to the officers who transact the business. The amount arising from the payment by each admitted member of *Three Dollars* for "membership fee," is placed in bank, from which account the running expenses of the Association are paid, only when bills are approved and audited by the Executive Committee. The amount arising from the payment by each admitted member of *Two Dollars* for "assessments," is placed in bank as special deposit. The money from the "Special Assessment Fund" can be drawn only upon the check of the Treasurer, countersigned by the President. Upon suitable proof of the death of any member of the League, the Committee pays the amount in the Special Assessment Fund (less five per cent.) to the person or persons whose names shall, at the time of the death of such member, be found recorded as his designated beneficiaries. Immediately after having ordered the payment of a death loss, the Executive Committee shall order another assessment of two dollars on each member, to be used in like manner.

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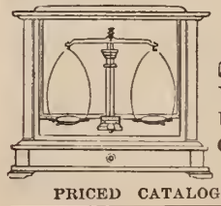
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☞Also make a specialty of
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Importer and Jobber of

WATCHMAKERS' & JEWELERS'

Materials, Tools and Optical Goods

Real and Imitation Stones,

☞For Manufacturing and Repairing Purposes
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Orders by mail will receive prompt attention.

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The tool is made of Steel throughout, with the jaws and wearing parts hardened. Every part is made to gauge. The finish is first-class and nickel plated. Warranted to outwear at least three of the imported pin vises.

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ABBOTT'S

Patent Winding & Hand Setting Attachment

FOR

American Watches



Henry Abbott,

Patentee & Manufact'r,

11 Maiden Lane,

NEW YORK.

Factory,
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Can be applied to all full plate 18 Size American Watches Price, including fitting, $6.00. Discount to the Trade.

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☞Watches of any kind altered from Key to Stem-Winders. Prices furnished on application.

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Manufacturer of

Watch Cases

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Jewelry.

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Many persons suppose this list to be composed of CHEAP, low-priced newspapers. The fact is quite otherwise The Catalogue states exactly what the papers are. When the name of a paper is printed in FULL FACE TYPE it is in every instance the best paper in the place. When printed in CAPITALS it is the ONLY paper in the place. When printed in Roman letters it is neither the best nor the only paper, but is usually a very good one, notwithstanding. The list gives the population of every town and the circulation of every paper. IT IS NOT A CO-OPERATIVE LIST. **IT IS NOT A CHEAP LIST.** At the foot of the Catalogue for each State the important towns which are not covered by the list are enumerated. **IT IS AN HONEST LIST.** The rates charged for advertising are barely one-fifth the publishers' schedule. The price for one inch four weeks in the entire list is **$635.** The regular rates of the papers for the same space and time are **$3,136.35.** The list includes **970** newspapers, of which **163** are issued **DAILY** and **807 WEEKLY.** They are located in **825** different cities and towns, of which **22** are State Capitals, **328** places of over **5,000** population, and **444** County Seats.

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THE JEWELER AND METALWORKER.

A fortnightly Journal for Watch and Clock-makers, Gold and Silversmiths, Electro-platers, Cutlers, Opticians, and all branches of the Precious Metal Trades.

WM ALLEN, EDITOR, 108 Barnsbury Road, London, N., England.

Subscription, per annum, FOUR SHILLINGS STERLING,

One Dollar Gold.

This Journal has a very large circulation among the above named and kindred trades in all parts of Great Britain and the Colonies and the U. S. of America and West Indies. A trial invariably proves its merits as an advertising medium. Terms for advertisements on application to the Editor.

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☞ Specimen copies on receipt of Five Cents.

Allgemeines Journal der Uhrmacherkunst.

Illustrirte Fachzeitschrift fur Uhrmacher.

Redacteur, Emil Schneider, Uhrmacher in Naumburg, Germany.

Agents for the United States, WM. MUHSAM, 316 W. Pratt St., Baltimore, and O. W. F. BURGER, cor 5th & Olive streets, St. Louis, Mo., who will give every information with regard to subscription and advertisements.

The "Allgemeines Journal der Uhrmacherkunst" has taken upon itself the task of elevating the art of watchmaking, and to protect and further the interests of the trade.

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IMPORTER OF

WATCH MATERIALS, AND TOOLS,

Spectacles, Guards, Chains, &c.

Wholesale Dealer in Jewelry.
ROCHESTER, N. Y.



GUTMANN'S

Automatic Hammer and Punches.

Patented January 8th, 1878.

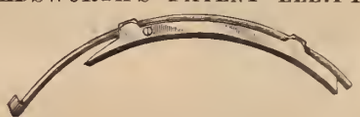
The operation is as follows: Insert your forefinger through the loop at the top and place the third finger as a guard on the lower end of the barrel, then with the thumb and second finger of the same hand, turn the cam ring which produces the concussion on the punch. This leaves the left hand free to hold the work.

Price, $2.50.

A liberal Discount to the Trade.

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WADSWORTH'S PATENT ELLIPTIC



Watch Case Spring.

Each holder is accurately fitted to the Case, and in a few minutes the Spring can be adjusted. The Spring works evenly from end to end, and without strain or wear to the most delicate Case.

☞ The Spring is made of the Finest Steel, Drawn and Rolled Hard, which gives it sufficient temper, and so adjusted to the Holder that it retains its elasticity, is not liable to break, and is superior to all others, because it is adjusted to the Case without drilling new holes, as is frequently done with the old Springs. ☞ $1.50 per dozen.

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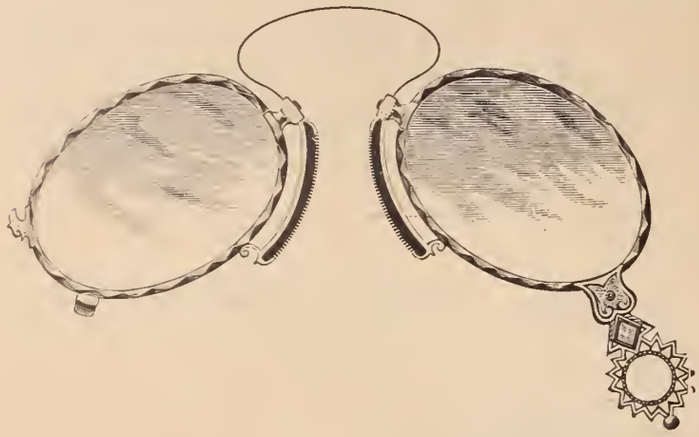
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SPENCER OPTICAL MAN'F'G CO.

MANUFACTURERS OF

OPTICAL LENSES,

Gold, Silver, Steel & Nickel-plated Spectacles,



Gold, Steel, Rubber, Celluloid and Shell Eye-Glasses,

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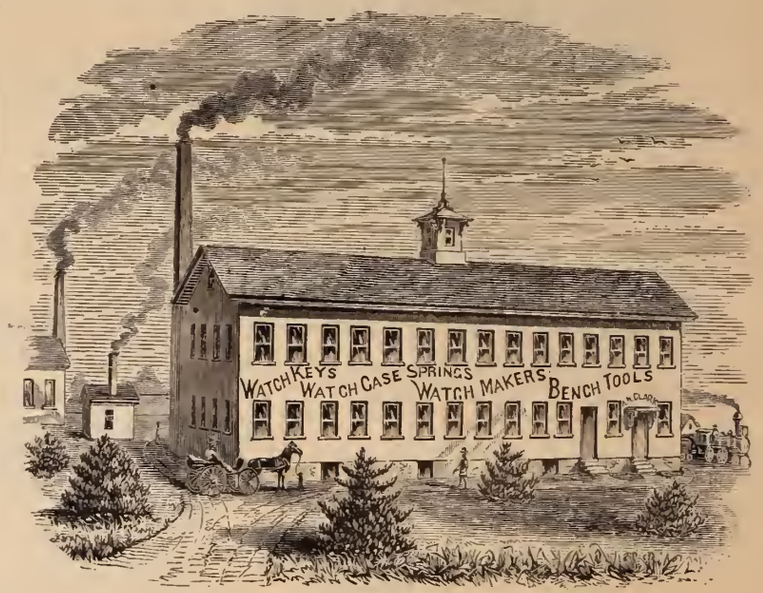
☞CELLULOID EYE GLASSES in new and desirable styles; the lightest and strongest material ever in use; representing Tortoise Shell, Jet and Amber. These goods are *now* mounted with metal springs. It is much more durable than shell or rubber; will not turn gray; has no sulphur in it, consequently will not tarnish jewelry, etc. Twenty-five pairs of the frames only weigh one ounce.

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CROSBY'S JEWELING TOOLS, &c.



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Small Articles in Metal manufactured to order.



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The Burbank Manufacturing Company

Manufacturers of GOLD & SILVER



Thimbles,



GOLD
SILVER,
STEEL,
RUBBER,
And SHELL,

EYE GLASS
Self Adjusting.

SPECTACLES AND EYE-GLASSES



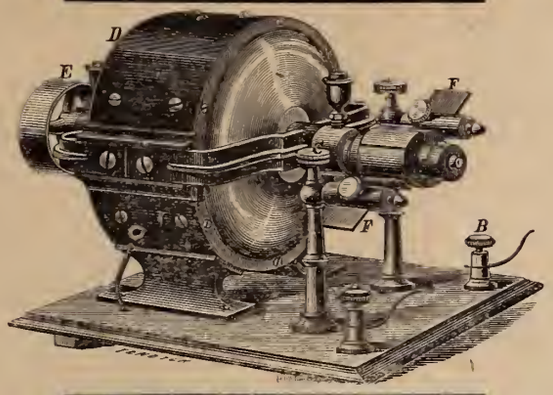
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CONDIT, HANSON & VAN WINKLE
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Machines for Electro-Plating, Electrotyping, Electric Light, Telegraphing, &c.

The Weston Dynamo-Electric Machine is constructed on an entirely ne principle giving the greatest amount of electricity with the least consumption of power. Its simplicity and ease of management has already made it the standard machine The success attending its introduction has already had the effect of inducing parties building machines for similar uses to adopt some of the devices peculiar to our new construction. We beg to call attention to the various patents covering our machines, and to the fact that we guarantee purchasers against any infringement of existing patents, as well as to their adoption and endorsement by the largest manufactnrers of the country, in many cases after a previous trial of all other machines.

THE MERIDEN BRITANNIA CO ,
WEST MERIDEN, CT., March 20, 1877.

MESSRS. CONDIT, HANSON & VAN WINKLE, Newark, N, J.

GENTLEMEN: You may send the two machines as proposed. I will say in regard to them they are splendid machines, and will say to any party you may refer to us that I shall advise them to take no other at any price, as yours is the best in my judgment, as we tried one, kept it, and took ont all our old machines and replaced them with two of yours (making three 12-inch machines in all). Just say to your customers we refer you to the largest Plating Works in the world. Yours truly,

H. C. WILCOX, President Meriden Britannia Co.

In addition to the testimonials in our Catalogue of January 1, we beg to refer to the following houses: Carter, Howkins & Sloan; Enos Richardson & Co.; Bates & Bacon; Short, Nevney & Co. Stephen Richards & Co.; Meriden Britannia Co.; Russell & Erwin M'f'g Co.; Reed & Barton; Hall, Elton & Co.; Richardson, Boynton & Co.; Wm. H. Jackson & Co.; Stanley Works; Rogers Cutlery Co ; Chas. Rogers Bros.; Edward Miller Co.; Mitchell, Vance & Co.; Norwalk Lock Co;; Hayden, Gere & Co.; Domestic Sewing Machine Co.; Eberhard Faber; Jos. Dixon Crucible Co.; Mumford & Hanson; Fagan & Son, and over 200 others. Outfits for NICKEL SILVER, BRONZE, PLATINO, etc. The two highest Centennial Awards, and three of the Centennial Medals of American Institute. In operation American Section, Paris Exposition.

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Williams & Cook's Dust-Proof Watch Keys,

LEBANON, N. H.

Patented Sept. 1st, 1874.



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PRICE PER GROSS.

The Popular Name Key.

A. Nickel Plated Handle and Pipe, Swivel Top..... $10.75

English Pattern Key.

C. Nickel Plated Handle and Pipe, Swivel Top,..... ..... $7.50

If anything different is required for one side of key than, Watch Maker and Jeweler, Watch Makers and Jewelers, Watches and Diamonds, Fine Watches, Fine Watches and Jewelry, Waltham Watches, Manufacturing Jewelers, or for any first order for name key less than one Gross, we make extra charge of $1.50 for Die.

Our Key Pipes are all warranted to be made of the finest quality of steel, and are absolutely dust and moisture proof, constituting by far the best and cheapest key manufactured. Our sizes run from 1 to 12, 1 being the largest size, 4, 5 and 6 being the common sizes for American watches.

☞For Sale by the Trade generally.

N. B. We have lately made a decided improvement in the Key in fastening the pipe to the handle, as well as the finish generally.

KENDRICK, DAVIS & CO., LEBANON, N. H.

FRASSE & COMPANY,

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French, Swiss, German & Sheffield Tools, Files,

Steel Wire and Materials,

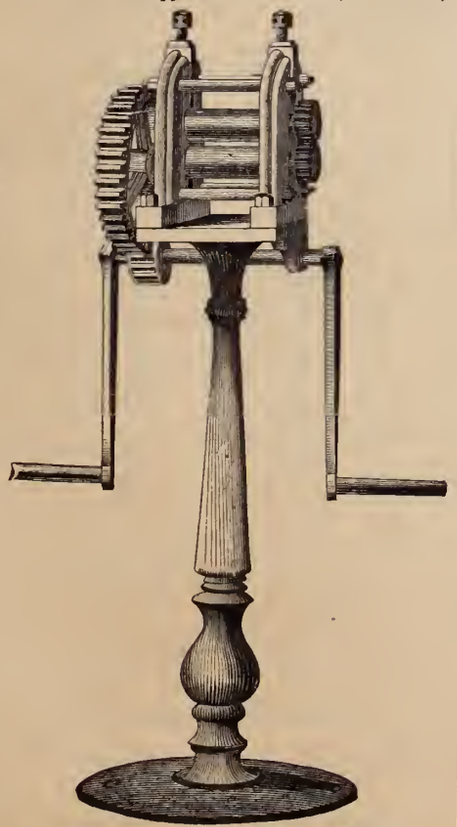
For Watchmakers, Jewelers, Engravers, Die-Sinkers, Machinist, &c.

Turning Lathes, Drills & Chucks

Rolling Mills, Draw Plates,

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Piercing Saws,



Horse Shoe Magnets,
Nurls,
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Engravers' Tools,
Brush Wheels & Buffs,
Hand Brushes and Buffs,
Borax,
Saltpetre,
Beeswax,
Rouge,
Tripoli,
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"Practical Hints on Watch Repairing."

BY "EXCELSIOR."

Will be sent to any address in the U. S. on receipt of

Price, $3.50.

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No. 42 Nassau Street, N. Y.

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TO LET.—One Room in building rear of 15, 17 & 19 John Street, with Steam Power. Chatterton & Dodd.

FOR SALE—An Universal Lathe in good order, drives with spiral gear. Price $30. Address A. S. M., care Jewelers' Circular.

JOSEPH HOEY & CO., No. 658 Broadway, New York, Photo-Wood Engravers,—each article engraved immediately from the photograph. The best and only reliable method.

WANTED—A situation as a watchmaker and engraver, 7 years' experience, 4 years of city experience. good references. Address C. W. W., Box 252, Waverley, Tioga Co., N. Y.

FOR SALE CHEAP—An American Lathe, almost new, in perfect order, with Universal head, nickel-plated slide rest and set of cutters. Send card for prices. A bargain for somebody. Address Box 29, River Falls, Wis.

J. C. SAWYER—Manufacturer of Gold and Plated Jewelry, Rings, &c. Orders by mail will receive prompt attention. Goods sent on selection to any part of the U.S. on receipt of N. Y. City references. Address all orders to J. C. Sawyer, Yonkers, N. Y.

THE UNDERSIGNED, desiring to locate South on account of ill-health, would sell out his stock of jewelry, watches, tools, fixtures, &c., very cheap, or exchange the same for similar stock in some Southern town. For further particulars address H. F Manchester, Box 29, Missouri Valley, Iowa.

WANTED—A man to work on watches, clocks and do jobbing. Must be honest, reliable, and a good workman, not addicted to the use of liquor. A young man preferred, or a married man whose wife would attend in the sewing machine room Address, with full particulars, Jos. P. Angell, Pine Bluff, Ark.

HENRY F. PIAGET—Manufacturer, Examiner and repairer of every description of fine stem and key winding watches. No. 36 Maiden Lane, New York. Pivots and jewels of any kind inserted. New pieces of every description made and fitted. Examining, repairing and cleaning done in the best manner. Send for price list of repairs on new pieces, e.c. Estimates given, when required, before doing the work.

BUSINESS NOTICES.

H. Howard & Co., of Providence, R. I., are constantly introducing exceedingly attractive novelties in rolled plate.

George W. Shiebler, manufacturing jeweler, has removed from No. 4 to No. 6 Liberty Place, second floor, for the convenience of buyers and the better display of goods.

J. Laurent, the well-known watch case manufacturer, has removed to 182 Broadway, increasing business having crowded him out of his old quarters in John Street. Mr. Laurent is now comfortably settled in his new business home, where he will be glad to see all those in search of elegant and artistic work.

L. A. Scherr & Co., importers and wholesale dealers in watches, jewelry, and tools and materials of all kinds, keep a full line of the above goods, suitable for the requirements of all classes of dealers. Their stock embraces everything that can be found in a well appointed wholestock store. Those of our readers who desire goods in their line would do well to call on them at their store, No. 726 Chestnut St., Philadelphia.

The well-known house of Keller & Untermeyer offer a large and attractive line of jewelry suitable for the requirements of all classes of dealers. Messrs. K. & U. are the patentees of the portrait Locket, one of the best selling articles of its kind in the market. They have recently assumed the agency of the International Watch Co., and offer a full line of these popular goods at remarkably low prices considering the high character of the goods.

Morgan & Headly, manufacturing jewelers and opticians, of Philadelphia, have consolidated the business of E. Want & Co., manufacturers of steel spectacles, eye glasses and optical goods, with their gold spectacle department in Philadelphia. The amalgamation of these two houses gives them additional strength and increased facilities in their optical department, which will enable them to fill all orders promptly. In addition to their display of rich jewelry, which is large and comprehensive, they are also direct importers of diamonds, of which they have a brilliant display. Messrs. Morgan & Headly enjoy the confidence of a large clientage of friends who will be glad to hear of their increased prosperity.

Buyer's Directory.

A Guide to the prominent Wholesale Houses in the Watch, Clock, Jewelry and kindred branches of Trade in New York, Philadelphia Chicago, and Providence.

New York.

Bohemian Garnet Jewelry.

Bissinger, Philip—Importer of Diamonds, Pearls and Precious Stones. Sole Agent for the Bohemian Garnet Jewelry in the United States and Canada. No. 22 John St., N. Y.

Clock Companies.

Seth Thomas Clock Co. Manufacturers of Clocks of all kinds. Salesroom, No. 581 Broadway,

Ansonia Clock Company.—Nos. 19 & 21 Cliff street, and 5 Cortlandt street, N, Y.

Waterbury Clock Co.—M. Bailey, Treasurer, Manufs. and Jobbers, No. 4 Cortlandt Street, N. Y., and No. 197 State Street, Chicago.

Corals and Coral Jewelry.

Bishop, Victor & Co.—No. 47 Nassau street, Importers of Precious Stones, Cameos, &c. Also manufacturers of Coral Jewelry.

Errico Bros.—Importers of Coral, Conch-Shell and Silver Filigree Jewelry, etc., 19 John St.

Granberry, T.—Specialty, Coral repairing for the trade, at reduced prices. Manufacturer of Coral and Black Onyx Jewelry. No. 51 Nassau street.

Lawson, Samuel.—Manufacturer of Fine Gold & Coral Jewelry; Coral Jewelry altered, refinished and repaired, No. 63 Nassau St., N. Y.

Cameo Cutters, Etc.

Bonet, L—(Successor to Bernerd & Bonet), Cameo Likenesses, 599 Broadway, N. Y.

Habermeier & Wiederer—Engravers of Cameo Likenesses, Seal Stones. Cameos repaired. 23 John St.

Zwetsch, L.—Cameo Engraver. Likenesses cut from Photographs. No. 42 John street.

Charms & Gold Watch Keys.

Rupp & Held,—Manufacturing Jewelers, Charms and Gold Watch Keys, with French and English Ratchets, a specialty. 15 John st., N.Y.

Cutlery.

Harrison Bros. & Howson,—Manufacturers of Fine Ivory and Pearl Table and Pocket Cutlery. No. 26 Cliff street. W. C. Burkinshaw, Sole Agent.

Diamonds.

Anderson, Otis,—Diamond Broker and Commission Merchant. No. 9 Maiden Lane.

Bernhard, A. & Co.—Manufacturing Jeweler & Importers of Diamonds and Precious Stones, also Diamond Mountings, No. 169 Broadway, Gilsey building.

Bissinger, E—Importer of Diamonds, No. 192 Broadway. New York.

Bissinger, Philip—Importer of Diamonds, Pearls and Precious Stones. Agent for the Bohemian Garnet Goods No 22 John St., N.Y.

Buckenham, Cole & Hall—Importers of Diamonds and other Precious Stones, No. 10 Maiden Lane, N. Y.

Fera. Henry—Importer of Diamonds, and Manufacturer of Fine Diamond Jewelry. No. 9 Maiden Lane, New York. Amsterdam, Holland, 23 Loojersgracht.

Herbert, R. J.—Importer and Broker in Diamonds, 24 John Street.

Morch, Jacob—Importer of Diamonds, Pearls, French & Italian Stone Cameos, Amethysts, Onyxes, and Precious Stones. Diamonds in pairs a specialty. No. 25 Maiden Lane, N. Y.

Neresheimer, E. Aug.—Importer of Fine Diamonds. No. 21 Maiden Lane, New York.

Diamond Cutters.

The Morse Diamond Cutting Co. of Boston.—Henry D. Morse, General Manager. N. Y. Office, 192 Broadway, corner John street. J. D. Yerrington, Agent.

Diamonds and Diamond Jewelry.

Bissinger, Philip.—Importer of Diamonds, 22 John street, N. Y. Agent for the Bohemian Garnet Goods.

Bornemann, Louis—Manufacturer of Diamond Jewelry from original designs, 169 and 171 Broadway.

Heller & Bardel—Manufacturers of Diamond Jewelry, and Dealers in Diamonds, No. 13 John street.

Marx, Kossuth & Co.,—Manufacturers of Diamond Jewelry, 39 Maiden Lane. Goods sent on selection.

Smith, Hedges & Co.—Importers of Diamonds Exclusively, and Manufacturers of Fine Diamond Jewelry, 1 Maiden Lane, cor. Broadway, N.Y

Taylor & Brother—Importers of Diamonds and Diamond Jewelry, 676 Broadway.

Diamond Setters, Etc.

Asher, J.—Jeweler and Diamond Setter, Precious Stones Inlaid and Incrusted with Diamonds, Nos. 880 and 882 Broadway.

Friend, S.—Manufacturer of Fine Jewelry, and Diamond Setter. 33 John street, N. Y.

Dials, &c.

Caesar Brothers—Manufacturers of Enameled Clock Meter and Gauge Dials, Patent Door, Coffin and Pew Plates, Druggists' Labels, &c. No. 32 John Street, New York.

Gold, John T.—(Successor to the late T. Gold), Enamel Watch Dial Maker, 81 Nassau St.

Enamelers, Etc.

Nutt, J. D.—Enameler on Gold, Silver and Copper, 32 and 34 John St. Birds, Flowers, etc., Enameled in colors.

Orr, Jas. C.—Enameler on Fine Jewelry, Flowers, Birds, &c., Enameled in colors. Band Bracelets (a specialty). 77 Nassau Street.

Engravers and Die Sinkers

Packner, Edward—Carver, Engraver and Chaser on Jewelry and Pencil Cases. Monograms Lettering, &c. 19 John Street.

Knapp, Charles—Engraver, Die Sinker & Manufacturer of Band Rings. 14 and 18 kt. Shanks and Heads for Rings, &c., 41 Maiden Lane.

Schuller, J. Dan'l—Stone Seal Engraver, Arms Crests, Initials and Monograms engraved on Stone Seals, &c 71 Nassau street.

Electro Platers.

Jeandheur, F., & Son—Gold and Silver Electro Platers & Fire Gilders, Coloring Etruscan and Gold Jewelry specialty, 117 Fulton Street.

Fancy Goods, Clocks, Bronzes, Etc.

Hinrichs, C. F. A.—Importer and Dealer in French, English and German Fancy Goods, etc., etc. 29, 31 & 33 Park Place, N. Y.

Magnin, Ve J. Guedin & Co.—Importers of Clocks Bronzes, Musical Boxes & Rich Faucy Goods etc., 652 Broadway.

Le Boutillier & Co.—Importers of Fancy Goods, Clocks, Bronzes, &c. 3 Union Square.

Gold Chains, Etc.

Beck, J. & Son, Manufacturers of Fine Gold Chains and Chain Bracelets, 10 Liberty place, near Maiden lane, N. Y.

Dorrance, Edge & Co.—Manufacturers of the Celebrated Woven Fabric Gold Chain, No. 9 John street.

Hamiltons & Hunt.—Manufacturers of Fine Plated Chains and Patent Buckle Bracelets. Branch office, 176 Broadway. Factory, 226 Eddy street, Providence

Kaufmann Bros.—Manufacturers of Gold Chains, and Chain Bracelets, 26 John street; Factory, 331 and 333 Bowery, N. Y.

Nord & Schlag,—Manufacturers of Gold Chain. No. 366 Broome St., N. Y.

Saxton, Smith & Co.—Manufacturers of Fine Gold Chain. 194 Broadway.

Gold Pens, Etc.

Aikin, Lambert & Co.—Manufacturers of Choice Gold Pens, Cases, Holders, Toothpicks, etc., 12 Maiden Lane, N. Y.

Mabie, Todd & Bard—Manufacturers of Gold Pens, 180 Broadway.

Todd, Edward & Co.—Manufacturers of Gold Pens, Pencil Cases, Tooth Picks, &c., 652 Broadway, N. Y. Factory, Brooklyn.

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JUNE, 1878.

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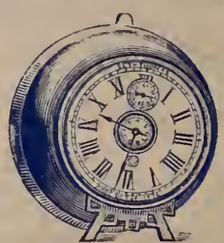
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SALESROOMS: 19 & 21 CLIFF STREET, and 5 CORTLANDT STREET, (Near Broadway **NEW YORK.**

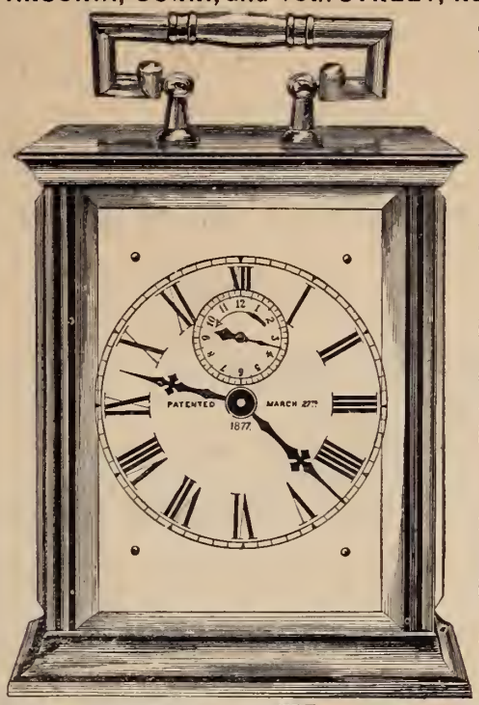
FACTORIES ANSONIA, CONN., and 10th STREET, NEW YORK.



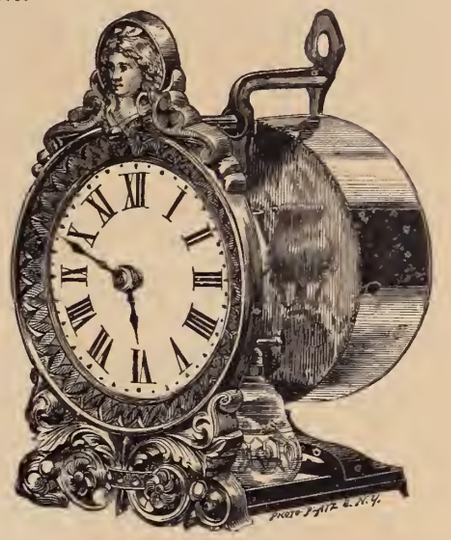
Peep O'Day Alarm.

One-half the size: Stem-Winding: Sets the alarm and winds at the back. "Only requires one spring" to be wound, and will go in any position.

NICKEL OR GILT. CARRIAGE. STEM-WINDER.



One Day Time, Alarm. No. 1, height, 5½ in. Eight Day Time. No. 2, height, 4½ in. Only one spring to wind. No. 3, height 3½ in.



Aladdin Night Light, Extra.

Nickel and Gilt. Stem-Winder. Patented November 1, 1877. One Day Time. Four inch dial. Height, 7 inches.

The above are excellent Time-keepers. Illustrations and prices on application.

A NEW LINE OF NOVELTIES WILL SHORTLY BE OFFERED.

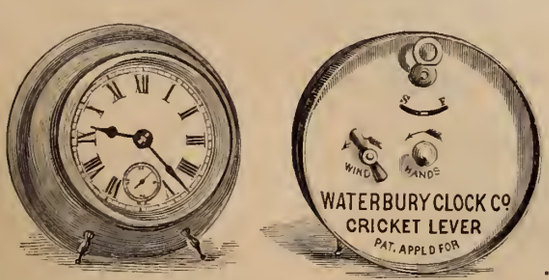
Waterbury Clock Comp'y

MANUFACTURERS AND JOBBERS OF

AMERICAN CLOCKS,

"Cricket." No. 4 Cortlandt St., New York. **"Sunrise."**

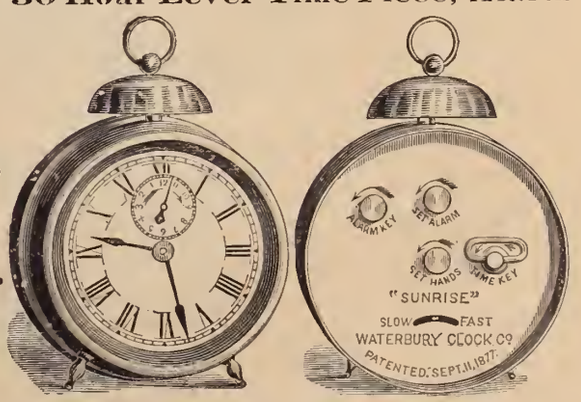
30 Hour Lever Time Piece. **30 Hour Lever Time Piece, Alarm**



ONE-THIRD ACTUAL SIZE.

197 State Street,
CHICAGO.
113 Sansom Street,
SAN FRANCISCO.
Factories, - - Waterbury, Conn.

M. BAILEY, Treasurer.



ONE-THIRD ACTUAL SIZE.

"CRICKET" & "SUNRISE"

Are Stem-Winders, No Keys Required, Reliable Time-Keepers, Will Run in any Position, Separate and Alarm Spring Set and Regulate at the Back. Nickel-Plated Cases.

SOLE AGENTS FOR THE ITHACA CALENDAR CLOCK COMPANY.

Illustrated Catalogues and Price Lists furnished to the Trade upon application.

SPRING TRADE, 1878.



J. C. AIKIN, H. A. LAMBERT, J. B. SHEA.

AIKIN, LAMBERT & Co.,

MANUFACTURERS OF

Gold Pens, Pencil Cases, Holders, Pencils, Picks,



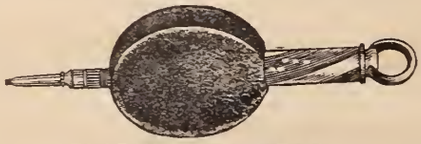
And RELIABLE JEWELRY in great variety,

THE LATEST NOVELTIES!

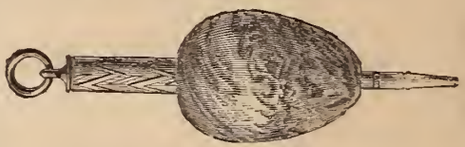
Patent Egg Pencil Charms, artistically mounted in Celluloid and Florida Beans.



CLOSED.



FLORIDA SEA BEAN.



OPEN.

Pencil Charms, Watch Keys, Masonic Emblems, Initials, &c.

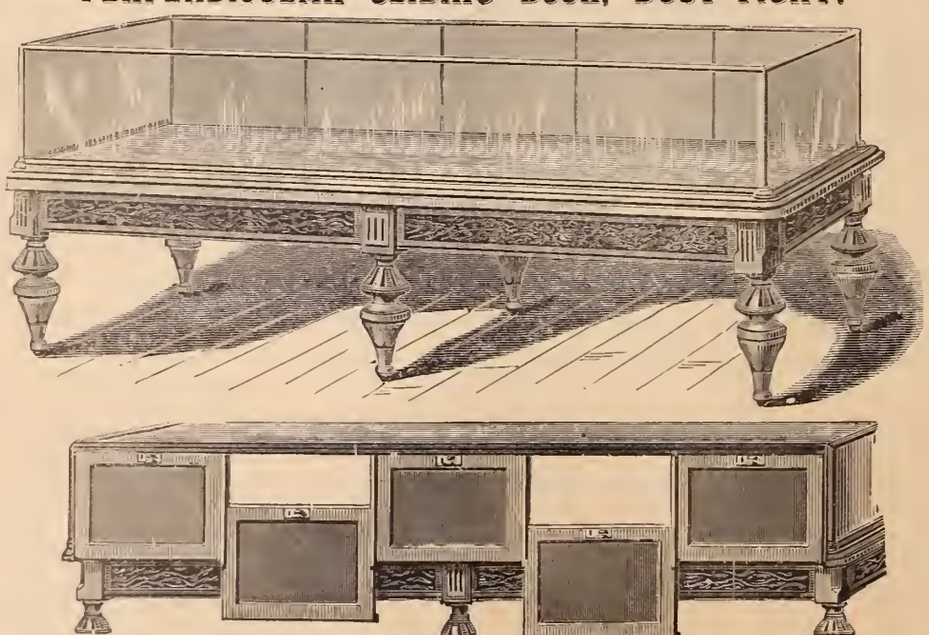
Our system of furnishing Show Case assortments, and establishing agencies, is broad, liberal and advantageous, and, as the originators of that method of display, now so popular with the Trade, we are offering liberal inducements to Agents. Prices recently reduced.

Illustrated Catalogues and Price Lists furnished upon application. Correspondence invited. Goods sent on approval when desired.

No. 23 MAIDEN LANE, NEW YORK.

PATENT IMPROVEMENT IN COUNTER SHOW CASES,

PERPENDICULAR SLIDING DOOR, DUST-TIGHT.



REAR VIEW OF CASE SHOWING SLIDING DOOR.

Its advantages are as follows:—The doors are more conveniently opened and closed, less liable to get out of repair or broken, articles are more easily reached in wide cases, mirrors are more safe, it dispenses with hinges, economizes room, excludes dust, and is air tight *when closed.*

☞ Drawings furnished and estimates given for fitting stores in cabinet work complete.

REFERENCES:—Gorham Mf'g Co., Rogers & Bro., Mitchell, Vance & Co. Meriden Britannia Co., M. S. Smith & Co., Detroit, Mich. D. Valentine, Syracuse, N. Y.

B. & W. B. SMITH,

220 West 29th Street, New York.



Mabie, Todd & Bard,

Manufacturers of

GOLD PENS,

Pen Holders, Pencil Cases and Tooth Picks,

in Gold Mounted Rubber, Pearl, Ivory and Solid Gold,

180 Broadway, **New York.**

We were awarded a Medal & Diploma, at the Centennial Exhibition, for excellence of designs, and high quality of workmanship.

Illustrated Catalogues and Price Lists sent to the trade upon application.

LOUIS STRASBURGER & CO.,

Importers and Makers of Watches,

OF EVERY DESCRIPTION,

From the Finest Stem-Winding and Setting Goods to the Lowest Priced Watch in the Market.

OUR STOCK is unusually complete and attractive and embraces an assortment of the best COMMERCIAL WATCHES to be found anywhere ranging from $4.00 to $600 each.

We would also call the attention of buyers to our select display of fine TIMING and COMPLICATED WATCHES, CHRONOGRAPHS and REPEATERS, of every description, from the establishments of the most eminent makers.

☞We are also the Sole Agents for the INTERNATIONAL WATCH CO.'s WATCH, so well and favorably known in this market.

LOUIS STRASBURGER & CO.,

NO. 15 MAIDEN LANE, NEW YORK.

Diamond Bureau,
No. 30 Boulevard Houseman,
PARIS

WATCH FACTORY,
CHAUX DE FONDS, SWITZERLAND.

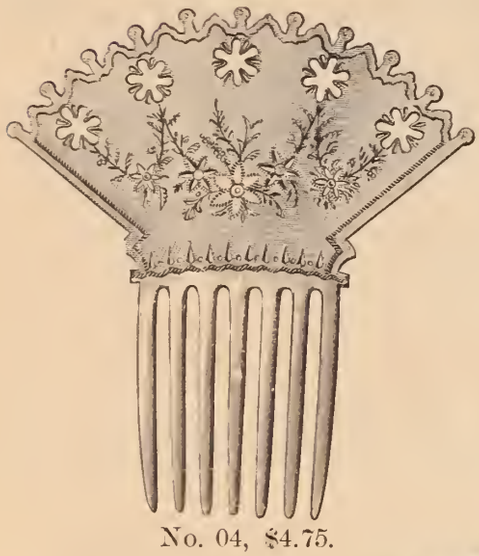
FINE SILVER-PLATED WARE,

MANUFACTURED BY

The Meriden Britannia Company,

No. 46 East 14th Street, Union Square, New York.

Attention is invited to the following **new styles of LADIES' SILVER-PLATED BACK COMBS,** *made in either silver, silver and gold, gold and oxidized, or silver and oxidized, all numbers and styles; are listed at $4.75 each, and are subject to the same discount as on Silver-plated Hollow-Ware, being made of a combination of silver, nickel silver and white metal.* **We warrant satisfaction as to quality.**



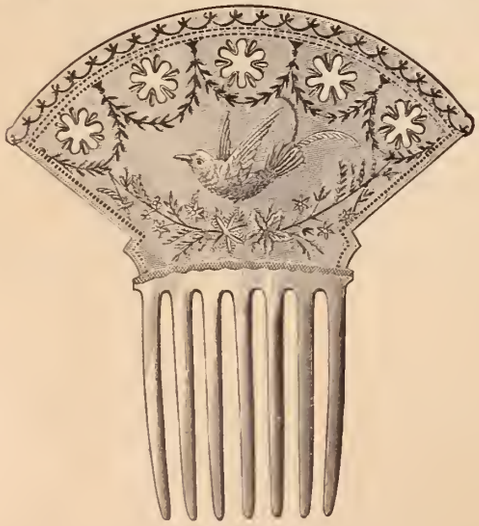
No. 04, $4.75.



No. 01, $4.75.



No. 06, $4.75.



No. 09, $4.75.



No. 010, $4.75.

THE PORCELAIN-LINED ICE-PITCHERS, ANOTHER SPECIALTY.—Valued for retaining the Purity and Coolness of Water, as well as for Durability, Cleanliness and Chemical Excellence of their Interior Surface. The Porcelain is Enameled on Hard Metal and cannot be broken or cracked by rough usage.

☞ **First Premiums** Awarded at all Fairs where Exhibited, from the World's Fair, 1853, to American Institute Fairs, 1873, 1874 and 1875, inclusive, and at the Philadelphia Centennial Exhibition, 1876.

Extract from American Institute Report.—"Their Porcelain-Lined, Double-Walled Ice Pitchers are **A 1**, and possess ALL the qualities the company claim."
"We consider the goods made by this company to be by far THE BEST made in this country, and we believe in the world."

Manufactories, West Meriden, Conn. **WAREROOMS, UNION SQUARE, NEW YORK.**

SUPERIOR ELECTRO-PLATE!

MANUFACTURED BY

THE MIDDLETOWN PLATE COMP'Y,

Factories, MIDDLETOWN, Conn.

Salesrooms, { 13 John Street, New York.
120 Sutter Street, San Francisco.

SUPERIOR HARD WHITE METAL,

SUPERIOR HEAVY PLATE,

SUPERIOR DESIGNS, WORKS OF ART

Wedding and Fancy Presentation Pieces in Elegant Designs.

Our assortment of Tea Sets, Urns, Butter Dishes, Syrup Cups, Baskets, Pitchers, Waiters, Goblets, Fruit and Berry Dishes is complete in **new designs.**

Our Patterns are Original! **Photographs sent dealers on application!**

SIMPSON, HALL, MILLER & CO.

Fine Electro-Silver Plated Ware,

Factories, Wallingford, Conn. Salesroom, No. 676 Broadway, N. Y.

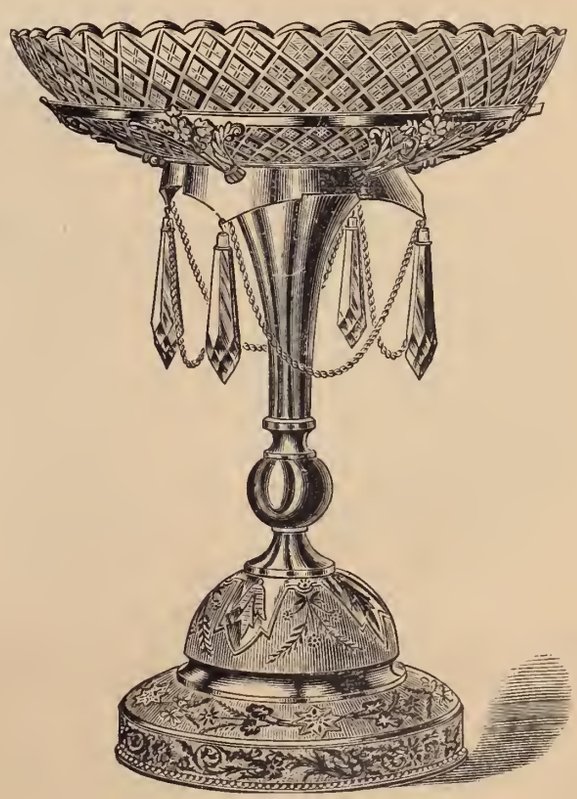
One of the oldest and most reliable manufactories in the country.

Our Solid Table Ware is made of the Best Nickel Silver.

Spoons, Forks, Ladles, Pie Knives, &c.

IN GREAT VARIETY OF PATTERNS.

Solid Steel Knives, superior article and Heavily Plated for Service.



OUR HOLLOW WARE consists of Tea Sets, Urns, Tea Trays, Spoon Holders, Milk and Water Pitchers, Butter Dishes with glass plates, Cake Baskets, Biscuit Bowls, Berry Dishes, Fruit Stands, Pickle and Jelly Dishes, Dinner and Breakfast Castors, Oyster and Soup Tureens, Baking Dishes, Steak Dishes, Vegetable Dishes, Celery and Salad Dishes, Syrup Cups, Tray and Rack for holding Spoons and Forks, also with Call Bell attached (patented). Toilet Sets in great variety of patterns, beautiful glass, richly mounted with silver, Vases, Card Stands combined. The glass Vases are of various patterns and styles; cut and fancy, of the most beautiful designs and mounted in the most elegant silver frames and stands. Centre Pieces and Epergnes, the most elaborate or plain, as desired; in fact thousands of articles in the line of Silverware, and all warranted to be first-class and exactly as represented.

☞ Our facilities being second to none to produce the finest and most serviceable *ELECTRO-PLATED WARE*, at the lowest possible price. By years of experience, close attention to business, and our unsurpassed facilities, we are enabled to produce goods as cheap, if not cheaper, than any other concern in this country, consequently dealers can feel assured that they will always get goods from us at the very lowest price. The pride of our house is to make the finest goods, and sell them at fair prices, and please our customers, by honorable dealings, and retain the reputation which, we believe, is unquestioned as to our making the best of goods and also the cheapest.

PATENT BUTTER DISH.

We have introduced this season an entirely new and novel Butter Dish. The convenience of its opening and closing can but strike one favorably. Its beauty of design and workmanship must please everybody. We have produced other valuable designs and patents in the way of Butter Dishes as well as many other useful articles in our line, but this is the most complete and perfect in its arrangement of anything heretofore produced, and must take the lead of all other first-class Butter Dishes in the market.

DAVID F. CONOVER & CO.,

(Successors to Wm. B. Warne & Co.)

Importers, Manufacturers and Wholesale Dealers in

WATCHES AND JEWELRY,

Silver and Silver-Plated Ware,

American Watch Wholesale Salesroom,

Southeast Corner Chestnut and 7th Sts.,

(FIRST FLOOR.)

David F. Conover,
B. Frank Williams,
C. Edgar Righter.

PHILADELPHIA, PA.

JAS. BOSS' PATENT STIFFENED



Gold Watch Cases

ARE MADE TO FIT ALL GRADES OF

American Movements.

The Manufacturers call the special attention of the Trade to their unequalled facilities for promptly filling orders for Cases for odd Movements, and the

NEW

Model Waltham Watches



HAGSTOZ & THORPE,

PHILADELPHIA, PA.

New York Office, 13 John Street.

Paris Exposition, Location C. 2.

GORHAM M'FG. CO.

SILVERSMITHS.

Factories, Providence, R. I.

SALESROOMS,
NO. 37 UNION SQUARE,
NEW YORK.

Sterling Silverware and the Gorham Plate.

HOLLOW-WARE.—Our manufactures in this important branch are of the widest range, covering all the wants for household use and decoration. Prize and Presentation Sets and pieces for general and specific purposes.

SPOON-WARE.—Complete illustrated sheets of our SPOON AND FORK PATTERNS, with price list, will be furnished to the trade upon application. The Hindostan which has been added to our list the present season has been most favorably received. Its style of ornamentation is, as its name indicates, Indian or Hindostan, equal to the Raphael in beauty of design, smooth to the touch, free from the objectionable feature of sharp edges, and by a judicious distribution of metal the very desirable feature of strength in the shank is obtained, giving the appearance of a much heavier spoon.

FLAT-WARE.—The variety of combinations, suitable for wedding and holiday gifts, range from a single article of trifling value to elaborate combinations of several hundred pieces. New styles of decoration in color has been an attractive feature in the productions of the present season.

CASES.—Elegant and desirable Cases for these varied combinations are of our own manufacture, including Plate Chests substantially made in plain and ornamental wood.

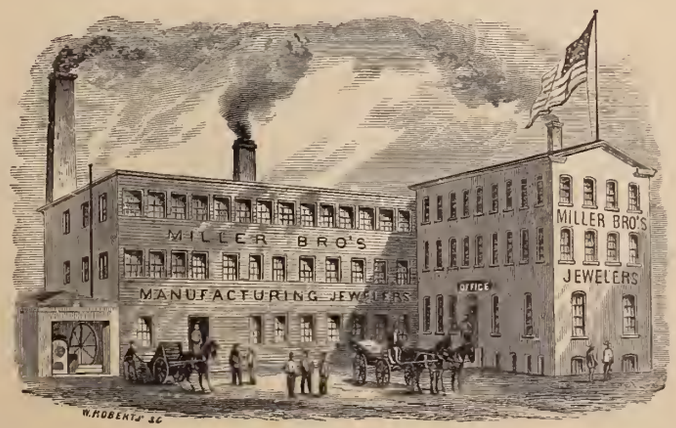
MILLER BRO'S,

MANUFACTURING JEWELERS,

No. 11 MAIDEN LANE, NEW YORK.

Manufactory, 47, 49 & 51 Franklin Street, Newark, N. J.

INITIAL GOODS A SPECIALTY!



Seals, Lockets, Sets, Sleeve Buttons, Studs, Collar and Chemise Buttons.

ATTENTION IS INVITED TO OUR

NEW STYLES OF ETRUSCAN SLEEVE BUTTONS,

MOUNTED WITH

RUSTIC LETTERS,

BIRDS, ANIMAL HEADS AND FANCY ORNAMENTATIONS.

Sussfeld, Lorsch & Co.,

IMPORTERS OF

Optical and Mathematical Instruments,

Watchmakers' Tools, Materials, Watch Glasses, &c.

No. 13 Maiden Lane, New York.

Sole Depot in the United States for
BARDOU & SON'S
Universal Opera Glasses,
U. S. ARMY & NAVY SIGNAL GLASSES,
&c., &c.

G B
TRADE MARK.

Sole Depot in the United States for the
CELEBRATED
Crown Spectacles and Eye Glasses,
OF ALL GRADES.

TRADE MARK

Commission Merchants at 27 Rue de Paradis, Poissonniere, Paris.

NORCROSS PATENT DUST-PROOF KEY.



KEY OPEN. Patented July 14th, 1874. KEY CLOSED.

This Key is preferred to all others, as there is no possibility of dust accumulating in the pipe. It will not break or wear like other Keys, being made of Stub's steel, hardened and tempered.

CLEMENS OSKAMP,

Manufacturing Jeweler,

And SILVERSMITH,

IMPORTER & WHOLESALE DEALER IN WATCHES,

CLOCKS, MATERIALS & OPTICAL GOODS.

No. 175 Vine Street,

CINCINNATI.

TRADE MARK

WM. C. GREENE & CO.

GOLDSMITHS

MANUFACTURERS of
RICH SETS IN TAPER WIRE CORAL

&c.
Ear Drops
Studs Crosses
Sleeve Buttons
Brooches
Enamel Sets
Engraved &
Coral Cameo
Amethyst
Stone Cameo

Factory
95 PINE ST.
Providence, R. I.

NEW YORK OFFICE, No. 192 BROADWAY.

WM. C. GREENE. B. W. GREENE. GEO. D. BRIGGS.

J. B. & S. M. KNOWLES,

MANUFACTURERS OF

Sterling Silverware

Office, No. 20 MAIDEN LANE,

NEW YORK.

Factory, No. 95 PINE STREET, PROVIDENCE, R. I.

ESTABLISHED 1859.

RINGS A SPECIALTY.

BRYANT & BENTLEY,

No. 12 Maiden Lane, New York.

MANUFACTURE A LARGE VARIETY OF

FINE SOLID RINGS,

For Ladies and Gentlemen, in CAMEO, AMETHYST, OXYX, TOPAZ, TURQUOISE, GARNET and other stones, Fine CAMEO, CORAL and ROMAN SETS of new and handsome designs. LOCKETS, MEDALLIONS, SHAWL and SCARF PINS, SLEEVE BUTTONS, STUDS, &c. All goods warranted.

☞ We continue to manufacture several hundred patterns of **HARD SOLDER RINGS**, in every style, for men, women and children, stamped and warranted 16 carat fine.

AMASA BRAINERD, JOHN W. STEELE, DYER BRAINERD.

BRAINERD, STEELE & CO.,

MANUFACTURERS OF

Brainerd's Pat. Lockets,



(Patented June 17, 1874.)

These Lockets combine both beauty and strength. They are made of solid 14kt. gold, and the stones used are the finest obtainable in the market. They cost no more than those of the old style, if indeed as much; and the combination of secrecy and durability renders them much more desirable. We make three sizes in four different shapes—round, oval, cushion and oblong square; and also Sleeve Buttons of the same style, containing a concealed box for miniatures, a novelty new to the Trade.



FINE GOLD JEWELRY,

No. 9 Maiden Lane,

NEW YORK.

DENNISON & CO.,

MANUFACTURERS OF

Paper Boxes, Jewelry Cards, Tags,

PINK AND WHITE COTTON,

JEWELERS' AND PLATE BRUSHES, SEALING WAX, RUBBER BANDS, &c.

SEND FOR CATALOGUE.

TISSUE PAPERS. Proprietors "Globe," and Centennial Prize "Excelsior," and Importers of English Grass, Bleached and Colored Tissue Papers, from the celebrated 39 mill.

Sole Propietors of Millers' Specialties !

JEWELRY CASKETS, SILVER WHITE CASKETS, and

SILVER WHITE, the best article for Cleaning Silver and Plated Ware. Samples furnished the Trade for distribution.

DENNISON & CO.,

Boston, New York, Philadelphia, Chicago, Cincinnati, St. Louis.

ESTABLISHED 1847.

J. T. SCOTT & CO.

Importers of Watches,

MANUFACTURERS OF JEWELRY,

—AND—

Jobbers in all grades of American Movements,

GOLD AND SILVER CASES.

Gold Chains, Jewelry, Diamonds, Clocks, Silverware, &c.

No. 11 Maiden Lane, New York.

☞Prompt and careful attention given to filling orders for all kinds of goods pertaining to the trade. Goods sent on approval when satisfactory references are furnished.

☞ Designs and estimates given, and special attention paid to orders from jewelers for Watches, Badges, etc., desired for presentations

☞Price List of American Watches, &c., sent only to regularly established dealers.

SAXTON, SMITH & CO.

MANUFACTURERS OF

Fine Gold Chain.

No. 194 BROADWAY,

New York.

Factory, No. 183 Eddy Street, Providence, R. I.

☞ **Sole Agents for the new PATENTED CHAIN BAR, containing a Detachable Pencil.**

WOOD & HUGHES,

STERLING

Silverware Manufacturers

No. 16 JOHN STREET,

NEW YORK.

BUCKENHAM, COLE & SAUNDERS,

SUCCESSORS TO

BUCKENHAM, COLE & HALL,

IMPORTERS OF

Diamonds, Pearls

AND OTHER PRECIOUS STONES,

MANUFACTURERS OF FINE JEWELRY,

10 Maiden Lane, New York.

☞A large stock of FINE DIAMONDS, Mounted and Unmounted kept constantly on hand. Goods sent on approval to any part of the country on receipt of satisfactory references.

Geo. Krementz. J. A. Lebkuecher.

KREMENTZ & CO.,

Manufacturing Jewelers,

No. 13 John Street,

Factory, 361 MULBERRY ST., Newark, N. J.

NEW YORK.

TRADE  MARK.

WHITING M'F'G COMPANY,
STERLING
SILVERSMITHS,
WORKS & WAREROOMS,
Broadway & Fourth St., New York.
WHOLESALE ONLY.

SMITH, HEDGES & CO.
IMPORTERS OF
DIAMONDS
Which are offered to the Trade, mounted or unmounted.
No. 1 Maiden Lane, cor. Broadway,
NEW YORK.

CARTER, HOWKINS & SLOAN,
Makers of
FINE JEWELRY,
Consisting of Chains, Bracelets, Sets, Pins, Studs, Sleeve Buttons, Rings, &c., in Roman, Etruscan and Enamel.
Whiting Building, Corner Broadway and Fourth Street,
A. CARTER JR.
WM. HOWKINS,
A. K. SLOAN.
NEW YORK.
C. E HASTINGS,
GEO. R. HOWE,
W. T. CARTER.

Established 1817.
Ve. J. MAGNIN, GUÉDIN & CO.
Manufacturers and Importers,
FINE SWISS WATCHES.
REPEATERS, CHRONOGRAPHS & CALENDARS.
GENEVA GOLD JEWELRY,
FRENCH CLOCKS AND BRONZES,
RICH FANCY GOODS,
HORSE-TIMERS & PODOMETERS,
GOLD AND SILVER CHATELAINE WATCHES.
No. 652 BROADWAY, NEW YORK.
Sole Agents for the James Nardin Watch.
House in Geneva, 14 Grand Quai.

HALE & MULFORD,
MANUFACTURERS OF
RICH JEWELRY,
(WHITING BUILDING),
No. 694 Broadway, corner 4th Street,
NEW YORK.
Stone and Stone Cameo Goods, Rings, Necklaces, Colored and Etruscan Work, Etc.
FIRST CLASS GOODS OF OUR OWN MAKE
EXCLUSIVELY!

BALDWIN, SEXTON & PETERSON
MANUFACTURERS OF
Fine Jewelry,
Diamond and Stone Cameo Goods,
GOLD CHAINS, &c.
Importers of Diamonds, Pearls, Emeralds, Rubies, &c.
WHITING BUILDING,
Cor. Broadway and Fourth Street,
NEW YORK.

WHEELER, PARSONS & HAYES,

MANUFACTURERS OF

Watch Cases, Gold Chains & Fine Jewelry,

AND DEALERS IN

AMERICAN AND SWISS WATCHES,

NO. 2 MAIDEN LANE, NEW YORK.

ENOS RICHARDSON & CO.

MANUFACTURERS OF

FINE GOLD JEWELRY,

Gold Chains, Lockets, Crosses and Necklaces,

COLORED AND ETRUSCAN WORK.

All Goods sold strictly of our own manufacture.

23 MAIDEN LANE, NEW YORK.

ENOS RICHARDSON, L. P. BROWN, F. H. RICHARDSON,
THOS. SLATER, W. P. MELCHER.

ONYX GOODS A SPECIALTY!

JOHN A. RILEY & CO.,

Manufacturing Jewelers,

ETRUSCAN GOLD AND CORAL SETS, ROMAN BRACELETS, NECKLACES, &C.

Nos. 7 and 9 BOND STREET

NEW YORK.

No. 126 Kearny Street, San Francisco, Cal.

Established 1813.

THOMAS G. BROWN,

MANUFACTURER OF

FINE JEWELRY,

NEWARK, N. J.

—AND—

9 BOND STREET, NEW YORK.

MOORE & HORTON,

JEWELERS,

No. 11 Maiden Lane, New York.

SPECIALTIES!

Stone Cameo, Onyx, Amethyst, Topaz and Pearl Rings. Studs, Collar and Sleeve Buttons.

☞Also our new fac-simile of Fine African Diamonds, mounted in Rings, Studs, Pins, Ear-rings, Scarf Pins, Medallions.

Joseph B. Bowden & Co.

MANUFACTURING JEWELERS,

SOLID GOLD RINGS

A SPECIALTY.

A LARGE ASSORTMENT OF PLAIN, CARVED, PLAIN BAND AND CHILDRENS' ALWAYS ON HAND. ALSO A FULL LINE OF CAMEO SLEEVE BUTTONS AND STONE RINGS.

Old No. 11 Maiden Lane, New York.

CARROW, CROTHERS & CO.,

MANUFACTURERS OF

FINE JEWELRY,

No. 12 John Street, New York.

Specialties!

FINE LINKED SLEEVE BUTTONS, ROMAN BAND BRACELETS, LOCKETS & CROSSES.

N. B.—We desire to call the attention of the Trade to our IMPROVED BRACELET CATCH, and our new styles of Link Sleeve Buttons.

Established 1846.

WILLIAM RIKER,

No. 5 Maiden Lane, New York.

Factory, 42 Court Street, Newark N. J.

CHATELLIER & SPENCE,

Manufacturing Jewelers,

652 BROADWAY, NEW YORK.

No. 1129 Chestnut Street, PHILADELPHIA, PA.

No. 12 West Street, BOSTON, MASS.

No. 120 Sutter Street, SAN FRANCISCO, CAL.

CHATTERTON & DODD,

Makers of Fine Jewelry

Consisting of Sets, Pins, Ear-Rings, Lockets, Crosses, Sleeve Buttons, Studs, &c.

No. 19 John Street, New York.

ROMAN, ETRUSCAN AND ENAMEL WORK GENERALLY, SPECIALLY DESIGNED BY US.

COE, PINNEO & STEVENS,

MANUFACTURERS OF

LOCKETS,

WHITE ENAMEL STUDS & BUTTONS,

Linen Finished and

FINE JEWELRY,

Old No. 9 Maiden Lane, New York.



Nº 24 DOELEN STRAAT AMSTERDAM, HOLLAND.
Nº 1 GAERTNER PLATZ MUNICH, GERMANY.

☞ *Diamonds loose and mounted sent on approval on receipt of satisfactory reference.*

LOUIS A. SCHERR. CHAS. H. O'BRYON. G. W. SCHERR.

LOUIS A. SCHERR & CO.

Importers and Wholesale Dealers in

Watches, Jewelry,

WATCH MATERIALS, TOOLS, GLASSES, &C.

Spectacles, Silk Guards, &c.

Wholesale Agents for American Watches.

No. 726 CHESTNUT STREET,

FIRST FLOOR,

PHILADELPHIA.

NATHAN E. MORGAN. CHAS. B. HEADLY.

MORGAN & HEADLY,

MANUFACTURERS OF

GOLD SPECTACLES,

FINE JEWELRY, CHAINS, BRACELETS,

18 Karat Plain Rings, &c.

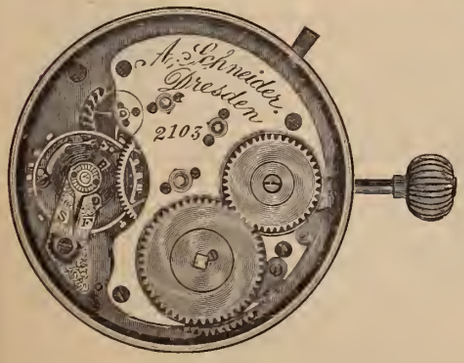
Artisan Hall, 611 & 613 Sansom Street,

PHILADELPHIA.

☞A full line of *DIAMONDS*, mounted and unmounted, always on hand, which we will send on approval to the Trade, on receipt of reference.

MAX FREUND & CO.

Manufacturing Jewelers.



IMPORTERS OF

Watches

Jewelry and Precious Stones.

8 Maiden Lane,

NEW YORK.

☞Sole Agents for the Celebrated A. Schneider Watch, Dresden.

Notice to the Trade.



In addition to our complete and extensive stock of watch materials of all kinds, we are also direct importers of the HENRY BEGUELIN, DROZ & PERRET, and other well known watches, the most desirable GOODS to be found in the market. We would direct especial attention to our **"Centennial Watch,"** of which we are the sole manufacturers. We deem it proper to caution the Trade against imitations of it by unscrupulous parties who are endeavoring to palm off inferior goods advertised as "Centennial Watches." We shall take legal steps to have it stopped, and shall prosecute all infringements of our rights in the premises.

Cross & Beguelin,

No. 21 Maiden Lane, New York.



Fac-simile of the "CENTENNIAL WATCH"

Ripley, Howland & Co.

MAKERS OF



FINE JEWELRY.



Would respectfully call attention to their patent PLATINUM TIPPED Settings for Diamonds (just introduced), an advantage dealers will readily appreciate, as the stone is held, not by yellow, but by scarcely perceptible *white* points which are equally strong and more durable than gold.

These *white* points impart an elegant appearance to the gem and relieve the setting of that coarse and unattractive look usually found in those entirely composed of silver or platinum.

PATENTED APRIL 16th, 1878.

NO. 35 MAIDEN LANE, NEW YORK.

FACTORY, 383 WASHINGTON STREET, BOSTON, MASS.

Dorrance, Edge & Co.

MANUFACTURERS OF

THE CELEBRATED WOVEN FABRIC

GOLD CHAIN.

Elegantly Mounted Bracelets, Opera, Leontine,

VICTORIA WATCH GUARDS & NECKLACES, in all the Newest Designs.

☞Our stock is unusually complete, and, in addition to the above, a variety of Necklaces, from 1½ to 40 dwt. each, to which we invite the attention of buyers.

No. 9 John Street, New York.

Factory, 46 Greene Street, Newark, N. J.

J. A. BROWN & CO.

OFFICE AND SALEROOM: No. 11 Maiden Lane, N. Y.
FACTORY: No. 104 Eddy St., Providence, R. I.

SOLE MANUFACTURERS OF THE

Ladd Patent Stiffened Gold Watch Cases



For the Movements of the various American Watch Co.'s, Gent's, Ladies' and Boys' sizes, Key and Stem-Winders, and in the following styles, BASCINE, FLAT-BEVEL and MANSARD, (this latter as originally named, modeled and introduced by them) forming the most complete and varied line of elegant Cases ever offered for sale. It is now eleven years since these Watch Cases were introduced to the public, during which period of time they have steadily gained in popular confidence and esteem, as is evinced by the unprecedented fact in the history of the Watch Trade that more than FIFTY THOUSAND of them have been manufactured and sold. Made of thick plates of Gold and Nickel Composition, (this Composition is harder and tougher than any other metal except the gold itself, and suggested the term STIFFENED, originally used by us to designate this important improvement; no other case in the world is made like it;) thoroughly welded together and rolled to the required thickness—they are, while equally handsome—stronger and more durable than the finest Solid Gold Cases of the same thickness of metal, and at ONE-THIRD or ONE-HALF the COST, and with good movements, they make the cheapest, most elegant and serviceable Watches in the market. The critical examination of these goods by the trade and public is invited. **FOR SALE BY JEWELERS GENERALLY.**

☞Dealers can obtain them of the Wholesale Watch and Jewelry Houses, or their Traveling Agents, throughout the United States and British Provinces.

☞All genuine Watch Cases of our manufacture, have "G. W. Ladd's Patent, June 11th, 1867," stamped upon the side band underneath the glass bezel.

Refuse all others. Send for full Descriptive Circular.

HENRY GINNEL,

Importer of Swiss Watches,

TOOLS AND MATERIALS, SILK GUARDS, &c.

And Jobber in all grades of American Watches.

No. 31 MAIDEN LANE,

P. O. Box 2967. NEW YORK.

In addition to our line of **SWISS KEY AND STEM-WINDING WATCHES, and Materials of all kinds,** we have a large stock of the celebrated **PIONEER Stem-Winding and Stem-Setting Watches** (manufactured expressly for us) and pronounced by competent workmen to be the best watch for the money in the market. They are cased in silver and German silver hunting or opened faced. **Send for Prices.**

Full Trade Discounts on American Watches.

TELL A. BEGUELIN,

(Successor to the late GINNEL & BRO.)

Importer of Watches

WATCH MATERIALS, TOOLS AND GLASSES,

No. 71 NASSAU STREET,

(UP STAIRS),

CORNER JOHN STREET **NEW YORK.**

Sole Importer of the TELL A. BEGUELIN'S BEST MAINSPRINGS.

☞Every description of Watches carefully repaired for the Trade.

MATHEZ

Watch Company,

Of NEW YORK.

Gents' and Ladies' Stem-Winding Movements

STRAIGHT LINE, 3-4 PLATE NICKEL.

These Movements are of six different grades, uniform in size and beautifully finished, and will be SOLD AT LOWER PRICES than any other goods of similar excellence.

☞A FULL LINE of materials for our movements always kept in stock for the convenience of those using our goods.

F. H. MATHEZ, Sole Agent,

No. 5 Maiden Lane, New York.

BOREL & COURVOISIER TO THE FRONT!

SWISS WATCHES

AGAIN RANK AS THE BEST.

IMPROVED MACHINERY HAS DONE THE WORK.

☞We are happy to inform our agents and patrons that the **new B & C.** are now ready. ALL ORDERS CAN BE FILLED AT ONCE! We are authorized to make a considerable reduction from former prices, in order to place them within the reach of all.

☞**Dealers wishing to act as authorized agents for the sale of these celebrated Watches and Movements will be furnished with full particulars by addressing, with business card,**

QUINCHE & KRUGLER,

No. 17 MAIDEN LANE, NEW YORK.

Sole Agents in the United States.

ESTABLISHED 1845.

SALTZMAN & CO.

MANUFACTURERS AND IMPORTERS OF

Fine Swiss Watches



SOLE IMPORTERS OF THE

AUGUSTE SALTZMAN
VICTOR VUILLAUME
ALBERT VUILLE
} **Watches**

SPECIAL NOTICE.

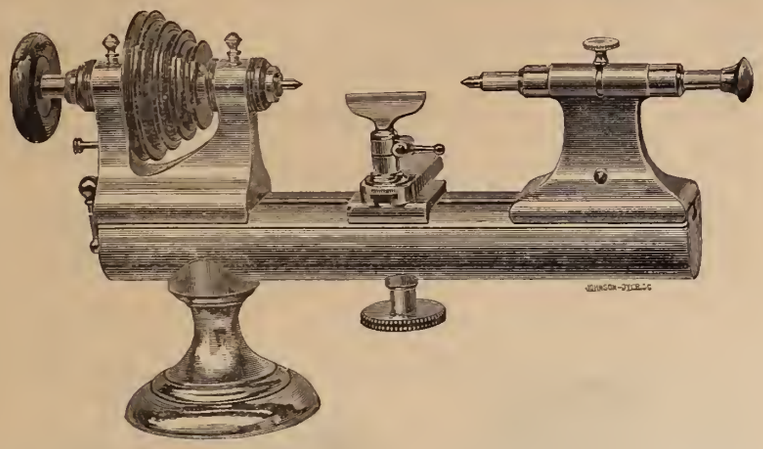
The Trade is respectfully notified to beware of imitations of the name of Saltzman, marked on Watches of an inferior grade, and purporting to be the genuine Saltzman.

No. 15 Maiden Lane, New York.

American Watch Tool Co.

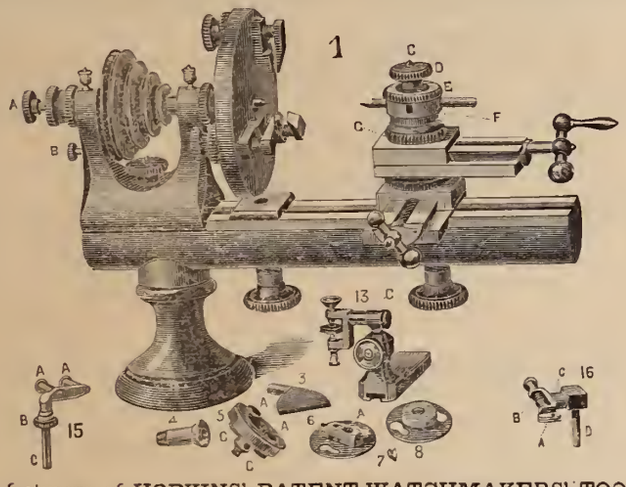
Formerly J. E. Whitcomb & Co.

Manufacturers of Watch & Chronometer Makers' Tools.



P. O. Box 999. WALTHAM, MASS

HOPKINS' WATCH TOOL CO.



Manufacturers of HOPKINS' PATENT WATCHMAKERS' TOOLS, embracing Plain and Combination Lathes, Chucks, Slide and Swing Rests, Gear Cutters, Pivot Polishers, Jeweling and Staking Tools, &c.

Illustrated circulars sent on application.

HOPKINS' WATCH TOOL CO., Waltham, Mass.

Medal and Diploma of Merit Awarded by Centennial Com.

S. C. JACKSON,

MANUFACTURER OF FINE

CASES

For Jewelry, Silver Ware, Trays, &c.

180

BROADWAY,

NEW YORK.



KOCH SONS & CO.,

MANUFACTURERS OF

Adjustable Leaves for Photograph Mounts

☞Specially adapted for showing Photograph Examples of Wares, arranged to bind in connection with our patent binder.



Every leaf is so arranged that it can be inserted or detached without disturbing the rest. ☞ Binders adjusted to the Jewelers' Circular, capable of holding one year's edition.

Full cloth, and embossed in gilt,.....$1.25
Leather back and corners, cloth sides..... ..... 1.50

No. 156 William Street, New York.

Office of MAX L. GUTMANN,

ROCHESTER, N. Y.

Importer and Dealer in Watch and Jobbing Materials, Tools, Glasses, Chains, Guards and Jewelry.

GUTMANN'S Automatic HAMMER & PUNCHES.



Patented January 8th, 1878.

This tool takes the place of the third hand, therefore its manifold uses are quickly apparent, and I would only say, that it is accompanied by six punches, to-wit: 1 prick punch, 2 hand punches, 1 closing hole punch, 1 rivet punch, 1 pinion punch, all of which fit neatly into the punch holder, and are fastened by the set screw. Its tap is alternately heavy and light, and the finger loops are assorted in sizes. The Tool is nickel-plated and boxed, ready to be mailed.

The operation is as follows: Insert your forefinger through the loop at the top and place the third finger as a guard on the lower end of the barrel, then with the thumb and second finger of the same hand, turn the cam ring which produces the concussion on the punch. This leaves the left hand free to hold the work. **Price, $2.50 Each.**

☞Sent by mail, post paid, by the manufacturer, or any first-class Tool Dealer, on receipt of price. A liberal Discount to the Trade.

☞Please send your order. Respectfully,

MAX L. GUTMANN,
Patentee and Manufacturer.

JOS. HOEY & CO.

Engravers on Wood

202 BROADWAY
NEW YORK

REMOVED TO No. 658 BROADWAY.

MANUFACTURERS OF EXCLUSIVELY

BLACK ONYX GOODS,

WOGLOM & MILLER,

32 & 34 JOHN STREET,

NEW YORK.

T. B. BYNNER,

IMPORTER AND JOBBER OF

WATCHES,

DIAMONDS AND FINE JEWELRY,

AND DEALER IN THE

BEST CLASS OF ROLLED PLATE JEWELRY

—AND—

Key and Stem-Winding American Watches,

No. 513 BROADWAY, NEW YORK.

BOOZ & THOMAS,

MANUFACTURERS OF

Watch Cases & Jewelry,

108 SOUTH EIGHTH STREET,

Second Story, PHILADELPHIA,

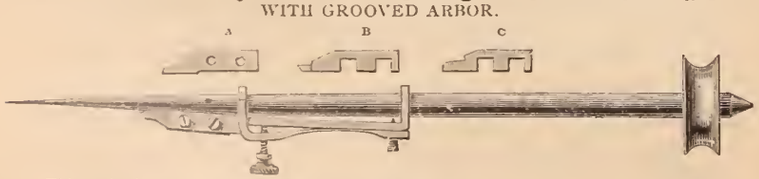
Illustrated Catalogues sent upon application.

Old Gold & Silver Bought or Exchanged.

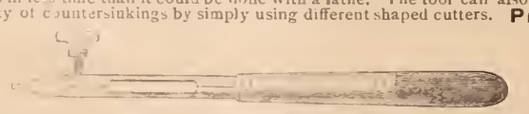
PARTICULAR ATTENTION PAID TO REPAIRING.

Schwerter's Patent Adjustable Jewel Setting and Counter Sinking Drill.

WITH GROOVED ARBOR.



This tool will enable any watchmaker of ordinary skill to do a good jeweling job, and in some cases in less time than it could be done with a lathe. The tool can also be used to make a variety of countersinkings by simply using different shaped cutters. **Price $5.**



This Cut represents **Schwerter's Patent Jewel Setting Opener,** a very handy tool, which will in almost every instance open a closed jewel bezel without injuring it. Price $1.25.

On receipt of Price these tools will be promptly forwarded to any address.

Address Aug. Schwerter, 51 Canal St., N. Y.

☞ A liberal discount will be made to dealers on orders of not less than ½ Dozen.

H. Muhr's Sons, Philadelphia.

MANUFACTURING JEWELERS,

Solid Gold Finger Rings of Every Description.



Crown, 18k. Lion.



On and after January 1st, 1876, our make of Filled Plain Rings will be stamped as above, which stamp is copy righted. Any and every infringement on the above Trade Mark will be dealt with according to law. ☞ Every one warranted.

THESE GOODS ARE SOLD BY ALL THE LEADING JOBBERS!

Should the house that any retailer deals with not have them we will furnish them with the address of the nearest Jobber. ☞ SELL TO THE JOBBING TRADE ONLY!

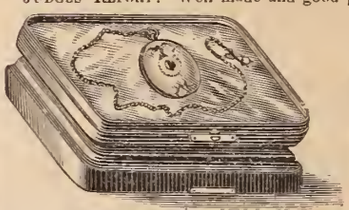
New York Office, 11 Maiden Lane.

☞ Address all communications to Philadelphia.

ESTABLISHED 1854. ☞ Medal and Diploma Awarded at Centennial Exhibition.

JUDGES' REPORT:—Well made and good patterns—Double Hinge as a useful improvement.

(Patented December 17th, 1867.)





G. F. KOLB & SON,

MANUFACTURERS OF FINE

Morocco, Velvet and Cabinet Cases,

FOR JEWELRY, WATCHES & SILVERWARE.

TRAYS FOR SHOW CASES, TRUNKS, &C.

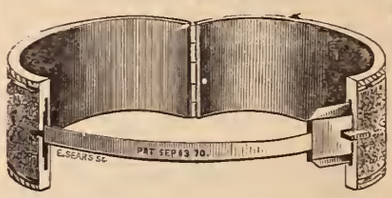
732 Sansom Street, PHILADELPHIA.

Established 1845.

WM. H. BALL,

SUCCESSOR TO

BALL & BARNARD,



Manufacturing Jeweler,

Fine Gold, Enameled and Colored

BRACELETS,

A SPECIALTY!

☞ All my Bracelets have the PATENT GUARD at no additional expense.

No. 9 JOHN STREET, NEW YORK.

Factory, 30 Franklin Street, Newark, N. J.

GEO. B. WHEELER,

NEW BEDFORD, MASS.

MANUFACTURER OF FINE

Watch and Clock Oil.



THE PORPOISE.

☞ This Oil is made from the best of stock, is free from gum or corrosion, will stand the coldest weather, and is every way reliable.

L. HAMMEL & CO., Sole Agents,

No. 9 Maiden Lane, New York.

Dealers in Watches

And DIAMONDS,

OPPENHEIMER, BROS. & VEITH,

Manufacturing Jewelers,

No. 35 MAIDEN LANE,

[Formerly 23],

S. Oppenheimer, A. Oppenheimer, } New York. { Henry F. Veith, Gus. F. Veith,

---

I. PFORZHEIMER. D. KELLER.

PFORZHEIMER & KELLER,

IMPORTERS OF

Watches and Diamonds

Dealers in American Watches,

AND

Manufacturers of Jewelry,

No. 24 JOHN STREET,

P. O. Box 4144. NEW YORK.

H. HOWARD. A. NICOUD. A. J. SCHERRIEBLE.

H. HOWARD & CO.

Manufacturing Jewelers,

No. 14 JOHN STREET, New York.

Factory, 102 Orange Street, Providence, R. I.

NOVELTIES IN STOCK PLATE A SPECIALTY.

CRYSTAL CHANDELIERS,

Gilt, Bronze and Decorated Gas Fixtures,

FINE MARBLE AND BRONZE CLOCKS

Bronze Figures and Ornaments in Greatest Variety, at Low Prices,

MANUFACTURED BY

Mitchell, Vance & Co.,

Nos. 836 & 838 Broadway, New York

"Medal of Special Award," by American Institute, 1872.

No. 719, GAS FIXTURES.

MITCHELL, VANCE & Co., 597 Broadway, N. Y.:

"We find the above-mentioned Fixtures and Glass Chandeliers, for design excellence of workmanship and finish in all their parts, to be the best production in the country and we may say, in our judgment, excelled by no other country in WORLD.

"We recommend a MEDAL OF SPECIAL AWARD for CHANDELIERS and GAS FIXTURES. (Signed) JOHN W. CHAMBERS, Secretary.

Medal of Special Award confirmed.

Goldsmith & Schliesser,

Manufacturing Jewelers,

—AND—

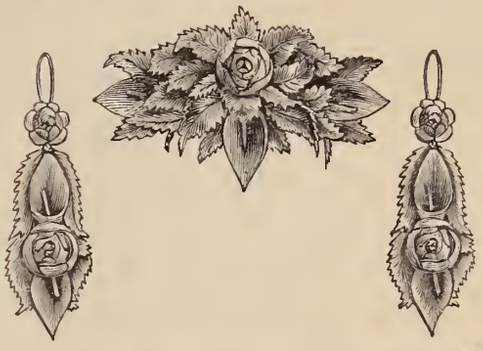
Importers of Diamonds & Watches,

No. 5 Maiden Lane,

Factory, 56 West 4th Street, **NEW YORK.**

Celluloid Novelty Comp'y,

W. S. SILLCOCKS, President. F. R. LEFFERTS, Sec'y and Treas.



MANUFACTURERS OF

IMITATION

Coral Jewelry.

4 Maiden Lane, New York.

☞Our goods are sold by all the leading jobbers in the country.

Van Houten, Sayre & Co.,

Manufacturers of Fine Jewelry,

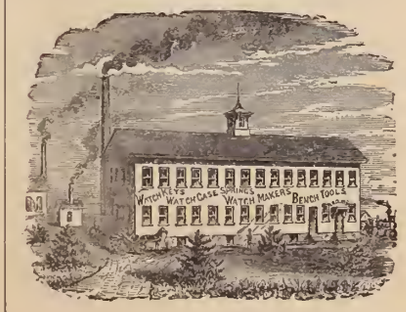
FACETED GOODS,

Office & Factory, 53 Chestnut Street,

NEWARK, N. J.

A. N. Clark, Plainville, Ct.

MANUFACTURER OF



WATCH KEYS,

WATCH CASE SPRINGS,

Watchmakers' & Jewelers'

BENCH TOOLS.

Crosby's Jeweling Tools, &c.

Sold by Jobbers in Watch Materials and Notions.

☞**Small Articles in Metal Manufactured to order.**

American Watch Company.

NEW YORK, MAY 1, 1878.

We desire to state that, with a view to improving our Full Plate grades of Movements, we have entirely remodeled them, with the following special advantages:

1st, The barrel does not project beyond the top plate, thus allowing a plain, tighter-fitting dust band to be used.

2d, The pottance is immovably fixed in the plate, and need never be disturbed. With this pottance so placed it is impossible for the balance to get out of upright, and it is a convenience for repairers. This valuable improvement is secured by patent.

3d, The angles of the pallet jewels, on both sides of the pallet, are the same, and the jewels are interchangeable, which is also convenient for repairers. By this means the whole escapemeat has been improved.

4th, An improved arrangement for letting down the mainspring without taking off the hands and dial. The barrel can be removed by simply taking off the barrel bridge.

5th, All, excepting the "Broadway" and "Sterling" grades, will have machine made conical pivot balance staffs—a great improvement on the hand-made. We shall be ready to put them in the "P. S. Bartlett" some time this month, and in the "Ellery" in June.

6th, All the top plate jewels are in settings except in the "Ellery" grade.

7th, The "A., T. & Co." grade is adjusted to heat and cold by new and improved methods.

8th, All grades, including "Broadway" and "Sterling" are warranted.

9th, The Stem-Winding and Setting Attachment is simpler, very convenient and more durable.

10th, The dials are firmly secured by screws.

11th, The hair-spring stud is in the cock, so that balance and cock can be taken off and replaced without danger of changing the rate of the watch.

12th, All the wheels and pinions run in the solid plate in jewels or otherwise, the third bridge being abandoned, so that no part of the train can get out of upright.

13th, Balances have mean-time screws—a great advantage in timing and poising when the watch needs repairing.

Finally, the general appearance is much improved by the design and finish of the watch. This is seen at once by comparison with the old models.

Particulars as to prices, etc., will be found on the 4th and 5th pages of our Price List, which will be forwarded on application.

ROBBINS & APPLETON, General Agents,

No. 9 BOND STREET, NEW YORK.

178 State Street, Chicago. 8 Summer Street, Boston. Waltham Building, London.



Front view of Watch,
Showing regular Time Dial.



Back view of Watch,
Showing Chronograph.

DEAR SIR:

The above is a cut of the WALTHAM WATCH with CHRONOGRAPH ATTACHMENT. This is attached to our 14th Size, (Gents') Stem-Winding and Stem Setting movement, either gilded or nickel. The Chronograph beats fifth of seconds, and is a fly-back, which works either from the stem or outside push piece, as may be desired.

We claim an advantage over the imported in this respect: it is applied to the back of the watch, thereby using a separate and independent dial, and not complicating the regular time dial as do the Swiss and all other imported Chronographs.

It is also very simple in construction, and in case of accident we can always supply duplicate parts which will not require fitting.

The dial of the Chronograph can be made solid if desired, so as to cover the works, which are represented as exposed in the above cut.

These Watches can be obtained from your local jeweler. If he has none in his stock, we can supply him at his request.

ROBBINS & APPLETON,

GENERAL AGENTS,

No. 9 Bond Street, New York.

EDWARD TODD & CO.

MANUFACTURERS OF

GOLD PENS,



Pencil Cases, Tooth Picks, &c.

No. 652 BROADWAY,

Factory, 29 & 31 South 11th St., Brooklyn. NEW YORK.

C. F. A. HINRICHS,

29, 31 and 33 PARK PLACE,

Cor. of CHURCH STREET, (Up-stairs) NEW YORK

Successor to M. WERCKMEISTER.

[ESTABLISHED 1801.]

IMPORTER AND DEALER IN

FANCY GOODS,

GLASS-WARE,

China, Bronzes, Clocks, Toys, &c.

Sole Agents for the Glass Factories of the Company "ANN," Namuroise, Belgium

Depot for Archery, Cricket & Base Ball Implements.

And C. A. KLEEMANN'S CELEBRATED GERMAN STUDY LAMPS,

Agent for ROGER'S GROUPS in Parian, &c.

ESTABLISHED 1855.

WELCH & MILLER,

MOROCCO, VELVET AND SATIN

JEWELRY CASE MANUFACTURERS.

☞Show Case Trays in Black Walnut and Rosewood.

Velvet Cases for Diamonds a Specialty.

No. 169 BROADWAY, NEW YORK.

CATALOGUES SENT ON APPLICATION.



In placing these Oils before the Trade, we do so with entire confidence, from many years' experience in procuring them from the fish, and in their preparation for use, and more than all, the thorough and SEVERE TESTS they have been subjected to in use upon Chronometers in our whale ships, often absent from fifty or sixty months. ☞Liberal samples furnished on application.

ROSKOPF WATCH.

J. D. HUGUENIN & CO.,

GENERAL AGENTS,

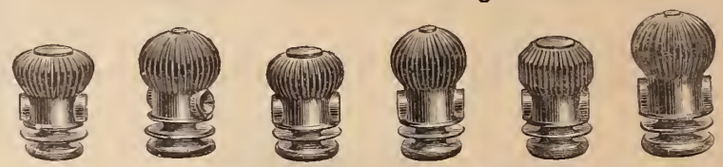
No. 12 Maiden Lane, New York.

The reputation of this Watch as an accurate timekeeper is fully established, and during the ten years that it has been before the Trade, has won an abiding reputation for fine Time-keeping qualities, and the BEST WATCH for the money in the world.

☞Send business card for price list.

MILNE & JOURDAIN,

Manufacturers of Stem-Winding Watch Crowns



13 & 15 Franklin Street, NEWARK, N. J.

Gold Crowns, for Stem-winding Movements, to suit all sizes of Imported or American Watches, in four different styles and seven sizes.

Gold Pushers for Key Movements in every size. Also Gold Crowns for fine Chronograph Watches made to order.

☞Silver Stem winding Crowns and Key Pushers on hand or made to order. Send for card and samples.

A. MILNE. A. JOURDAIN.

D. LIECHTY, B. LEVY.

D. LIECHTY & CO.

MANUFACTURERS OF

Gold & Silver Watch Cases,

IMPORTERS AND DEALERS IN

SWISS & AMERICAN WATCHES,

No. 402 Library Street,

PHILADELPHIA.

Lubricating Oils, for Watch, Clock and Chronometer Makers.

The discovery of a Lubricator for FINE MACHINERY, such as Watches, Clocks and Chronometers, that is free from gum and corrosive substances, has taxed the ingenuity of hundreds of men whose efforts have proved a failure. But we are happy to say (being largely interested) that such an article has been supplied by MR. EZRA KELLEY, of New Bedford, Mass., who, after forty years study of the subject, has perfected a Lubricator that recomends itself to all who have used the *genuine*, (there having been numerous counterfeits in the market,) as witness also the award of a Diploma and Medal by the judges of the late Centennial Exhibition at Philadelphia. We have no hesitation in saying that his Oils are the BEST manufactured, always uniform in quality and capable of standing all tests applied to lubricating oils. We cheerfully recommend it to all who may in their business require a FIRST-CLASS LUBRICATOR







AMERICAN CLOCK CO., (Hine & Thomas.)

P. S.—The above Oils can be procured at all first-class wholesale Watch and Clock Establishments in the United States, as well as his only Agents, GRIMSHAW & BAXTER, 35 Goswell Street, London England.

New Bedford, October 15, 1877.

HALL, ELTON & CO.,

Manufacturers of the Finest Electro-Plated Ware.



The "ORLEANS."

UNSURPASSED IN QUALITY, STYLE AND FINISH!

Factories, Wallingford, Conn. Salesroom, 75 Chambers St., New York.

ROGERS & BRO.,

Manufacturers of First-Class Electro-Plate,

No. 690 BROADWAY, near Fourth Street, NEW YORK.

Particular attention is called to the new Patented Process of Plating, whereby the most exposed parts are Plated the heaviest. Also, to the new Patented Heavy Spring Tempered Shanks on Forks and Spoons.

☞ *Price Lists mailed on receipt of application, enclosing business card*



BARTENS & RICE,

No. 20 JOHN STREET. NEW YORK.

Importers of Watches,

Watch and Chronometer Makers.

WATCHES OF OUR OWN MAKE.

SOLE AGENTS FOR THE

NICOLE, NIELSEN & CO., LONDON WATCHES, AND FOR THE STAR WATCH COMPANY, GENEVA.

☞ Medals and Diplomas at the International Exhibitions in London '62, Paris '76, Vienna '72, Philadelphia '76.

REMOVED

From No. 3 to

No. 20 John Street,

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L. & A. MATHEY,

IMPORTERS OF FINE WATCHES AND MOVEMENTS

Removed Feb. 1st, to 16 Maiden Lane.



Independent ¼ Seconds, Minute Repeaters, Minute Chronographs, Plain Chronographs, Double Chronographs, Independent Split Seconds, Perpetual Calendars, Pocket Chronometers.

MINUTE CHRONOGRAPHS, WITH MINUTE REPEATER.
CHRONOGRAPHS, WITH MINUTE REPEATER.
AND A FULL LINE OF MEDIUM GRADE WATCHES AND MOVEMENTS.

Sole Agents for the H. L. MATILE WATCHES.

☞ Timing and Complicated Watches a specialty. All our Watches are tried and tested before delivery. ☞ Goods sent for examination on satisfactory references.

"TIME AND TIME-KEEPERS," an interestng essay on the rise and progress of Watch-making, sent free to any address on application.





☞ *"Medal and Diploma awarded at Centennial Exposition for superior mechanical execution and artistic ornamentation."*



Established in 1854.

C. & A. PEQUIGNOT,

Manufacturers of Watch Cases.

DEALERS IN AMERICAN WATCHES AND IMPORTERS OF FINE KEY AND STEM-WINDING MOVEMENTS,

Salesroom & Manufactory, 22 South Fifth Street,

PHILADELPHIA.

A full stock of Key and Stem-Winding Gold Cases always on hand. Goods sent on approval when satisfactory references are furnished.

HOLMES, BOOTH & HAYDENS,

MANUFACTURERS OF

ELECTRO-SILVER PLATED

Spoons, Forks, Ladles, Fancy Pieces,

Solid Handle Steel Knives, &c., of the finest quality.

No. 49 Chambers Street, **NEW YORK.**

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Works at Waterbury, Conn.

Established 1828.

JACOB BENNETT & SON,

Diamond Setters and Manufacturing Jewelers,

No. 108 SOUTH EIGHTH STREET, PHILADELPHIA.

WE MANUFACTURE AND MAKE A SPECIALTY OF
EVERY DESCRIPTION OF
DIAMOND MOUNTINGS
SUPERIOR IN DESIGN AND WORKMANSHIP.



MASONIC MARKS,
Presentation & Lodge Jewels,
SOCIETY AND POLICE BADGES MADE TO ORDER.
FINE WHOLE PEARL JEWELRY.

GOODS ON SENT MEMORANDUM TO ANY PART OF THE UNITED STATES.

CHARLES CLATZ,

MANUFACTURER OF

Gold and Silver Watch Cases,

HAS REMOVED FROM No. 1

To No. 41 Maiden Lane, New York.



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Many beautiful Designs for Class Rings introduced for 1878.

NOVELTIES IN BANGLE RINGS: "Mizpah," "Roma," "Salve," "Bonheur," &c.

NICOUD & HOWARD,

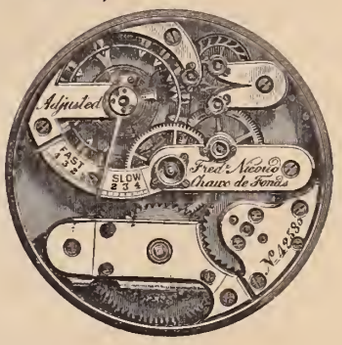


Importers of Fine Swiss Watches,

14 JOHN STREET, NEW YORK.

TRADE MARK
NICOUD WATCH
N & H

Factory, 12 Rue St. Pierre, Chaux de Fonds, (Suisse.) Established 1847.



Sole Importers of the { Frederic Nicoud / Fred Nicoud & Son / Arnold Nicoud / Louis Nicoud } WATCHES.

☞ *All Watches fully Warranted as to quality of Movements and Cases.*

SPECIAL NOTICE! MANUFACTURING JEWELERS, CHEMISTS, &c.

BROWN & BROS.,

No. 81 CHAMBERS STREET, NEW YORK.

Manufacture CHEMICALLY PURE COPPER for ALLOYING, and are prepared to fill orders for same, either in the Wire, Strip or Granulated form. Its PURITY has been attested as follows.

UNITED STATES ASSAY OFFICE, 30 WALL STREET,
NEW YORK, Dec. 21st, 1877.

BROWN & BROS.

Dear Sir.—We have analyzed the two samples of Copper left with us on the 18th instant, one said to be foreign refined Copper as used by jewelers, the other a refined Copper as manufactured by you for the same purpose. We find both samples alike in purity, and no difference can be detected by a careful chemical analysis, both being samples of PURE METALLIC COPPER, having no traces of antimony, tin, arsenic, zinc or lead.

TORREY & EATON.



BIRCH'S PATENT

Self-Adjusting Watch Keys.

FOR SALE BY THE TRADE GENERALLY.



Patent articles made by Contract or on Royalty.

J. S. BIRCH & CO.,

No. 38 Dey Street, New York

Established 1837.

French Marble Clocks.

An experience of over thirty years in establishing these goods in Europe, gives us especial facilities and advantages. Our stock having been replenished by recent heavy importations, we now exhibit a most complete and attractive line of novelties.

ARTISTIC POTTERIES, BRONZES, &c.

Orders Solicited from Dealers for Special Importations.

☞OUR WAREROOMS, AT 676 BROADWAY (Up Stairs), ARE FOR THE WHOLESALE TRADE EXCLUSIVELY.

TAYLOR & BROTHER,

(Late Taylor, Olmsted & Taylor.)

Sole Agents of Jacques Le Coutre Razors. See notice of our DIAMOND DEPARTMENT next issue of this journal.

J. EUGENE ROBERT, Importer of Watches,

No. 30 Maiden Lane, New York.



Sole Agents for { Longines Watch Company. "Agassiz" Ladies' Stem Winders. LOUIS AUDEMARS' FINE AND COMPLICATED WATCHES.

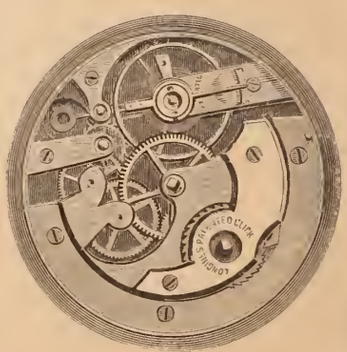
Stem-Winding and Setting Movements,

IN NICKEL AND IN SILVER CASES.

GENTS' AND BOYS' SIZES.

Unsurpassed for durability, PRICE and Timekeeping qualities. Manufactured on the system of uniformity of sizes and interchangeability of parts.

FINISHED MATERIALS ON HAND.



Paris, 1867. Vienna, 1873. Philadelphia, 1876.

Fac-similie of the LONGINES STEM-WINDER, so popular in the Trade.

TIFFANY WATCHES.

Fifth Second.  Fly-Back.

Independent MINUTE and SECOND Chronographs.

(SINGLE AND SPLIT SECONDS.)

THE above cut represents our new Watch, which we take pleasure in introducing to the trade as the most complete, accurate and reliable, for sporting and scientific requirements. At each revolution of the chronograph *second* hand, the small hand in the upper sunk dial records *one minute*, and when at the finish of the observation or race, the *exact* time is wanted, the number of minutes are found to be recorded as well as the fifth part of a second. To time the $\frac{1}{4}$, $\frac{1}{2}$ or $\frac{3}{4}$, press the push at figure 9, when one of the split second hands will stop ; after obtaining the time, press the same push again, when the hand will fly forward to the other split second hand and continue its course with it as before. By pressing in the push at the stem, the minute hand on sunk dial and the chronograph second hands fly back to their original positions.

ALL Watches of our make have the firm name "TIFFANY & Co." engraved upon the movements, and the trade and public are cautioned against apparent fac-similies put upon the market by certain *unscrupulous* dealers. The TIFFANY Watches are cased in 18 KARAT GOLD, have an established *retail* price, and we *positively* refuse further supplies to anyone underselling them.

☞ *Goods sent for selection or examination on receipt of satisfactory references. Orders for engraving, ornamenting or refinishing nickel movements, and engraving inscriptions, devices, and monograms on cases promptly attended to.*

TIFFANY & Co.

MAKERS OF

FINE AND COMPLICATED WATCHES,

NEW YORK, PARIS, LONDON, GENEVA.

Wholesale Office, 14 John Street, New York.

GEO. R. COLLIS, Manager.

☞ *Also General Agents for Messrs.* PATEK, PHILIPPE & Co., *Geneva, Switzerland, a full line of whose watches will be found at our office.*

ILLINOIS

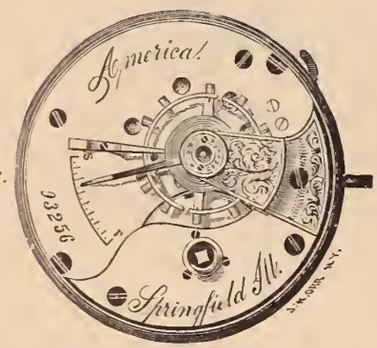
Springfield Watch Comp'y,

MANUFACTURERS OF

KEY AND STEM-WINDING MOVEMENTS.

Patent Setting Bar on Stem-winders.

18 *Size.*



"AMERICA," Stem-wind.



8 *Size.*

"ARLINGTON."

The attention of the Trade is called to the above new grades, the "America" being added since the issue of our list May 1st. Corrected lists can be procured from jobbers—dated May 20th—upon which will be noticed reduced prices of "INTERIOR," and the above addition.

☞ Any 18 Size Stem-Wind grades, *not adjusted*, will be made *on order*, for OPEN FACE Cases, with XII at the pendant and seconds opposite, without extra charge. They should be ordered about six weeks in advance.

Wholesale dealers will furnish glass signs, made especially for store windows, upon application.

OFFICES.

11 MAIDEN LANE, NEW YORK. SPRINGFIELD, ILLS.

The Dueber Watch Case Factory,

NEWPORT, KY.



AN INDISPUTED FACT!

The "DUEBER" Coin Silver Cases speak for themselves.

Dealers who wish to build up a reputation upon the merits of the goods they sell **can not** afford to be without them.

The Dueber Watch Case M'fg Co.

CINCINNATI AND CHICAGO.

What a Practical and Scientific American Watchmaker says about Swiss and American Watches.

GENEVA, March 26, 1877.

MR. EDOUARD FAVRE-PERRET, Locle, Switzerland.

Dear Sir:

Having been informed that you are sufficiently familiar with the English language, I need not offer any apology for addressing you in it.

The object of this letter is to ask a few questions, and perhaps make a few comments, upon the speech delivered by you at Locle, Chaux-de-Fonds, and in this city a short time since. Papers containing the speech in English have been sent to me from many parts of the United States as well as from England, with the questions, "What does all this mean? Can it be possible that Mr. Favre-Perret has said these things? Was E. F. P. paid for this speech by the American Watch Company?" etc., etc. These questions are but specimens of what is asked by those among my friends who are not connected with our profession, and only know of, or about, the Swiss watch industry what I may have happened to tell them in a casual way. At first, I thought best not to waste my time, nor trouble myself, about the matter, but I find the American Watch Companies are expending a fortune in displaying your words to the American public through the medium of newspapers and otherwise, and thus, in the most unjust manner, reflecting discredit and bringing ruin upon an industry of which Switzerland, above all other countries, has a right to feel proud.

I send you by this mail a copy of an American journal containing your speech, for the publication of which the American Watch Company paid (I am told) nearly two thousand francs for the single insertion.

I am an American, and have been connected with the watch business in my own country for the past twenty-five years, and I trust you will not deem it a boast on my part if I state that I am acquainted with American Watch manufacture in all its details. It is well known to my acquaintances, both in and out of the trade, that I came to Switzerland to manufacture a watch which I claim *cannot* be made in the United States, for want of proper facilities and the indispensable skilled labor. Therefore, you can well see why your speech above referred to should be questioned by others, as well as myself. Many statements in it are so far at variance with what my experience has taught me, both in America and this country, that I am at a loss to understand whether you intended that your remarks should be taken as the language would seem to imply.

You say, "In America, everything is done by machinery; here in Switzerland, everything is done by hand." Question:—How can this statement be reconciled in the face of the fact that Switzerland is overflowing in her abundance of watch-machinery?

In Geneva, we find factories with long lines of machinery of the choicest kinds, some running with power derived from immense water-wheels, others by water-engines. Many of these machines are wonderful specimens of ingenuity. I have never yet seen in any American factory useful machines equal to many which are running every day in Geneva. If they were in the possession of some of the American Watch Companies, they would at once tell the world about their wonders, and also make a point of displaying them at universal exhibitions. But here in Switzerland no display is made with them; they are allowed to do their work silently and faithfully, and then exhibit to the world their products; and heretofore, there has never been any occasion for telling the people of the United States, or of any other country, anything about the superior qualities of these products. The world with eyes to see for itself might at once recognize this excellence as it always has done, until within the past few years the glaring and mendacious advertisements of the American Watch Companies have (Patent Quack Medicine style) filled the newspapers, and it is not to be wondered at that people at last look amazed, and in sheer perplexity ask "How is this?"

In order that you may not consider my expression in reference to American advertisements unjust, I may remark that some of the Watch Companies tell the public, through the press, that they make watches which run twelve months and longer, the total variation not exceeding two seconds during the entire time. It is surprising that they should not say twelve years, and longer, for it would be just as easy to print, and their watches might just as well be expected to run so many years as months, within two seconds. Further comment upon such trash would be superfluous, and I will at once revert to the subject proper.

Nor can Geneva alone boast of her elaborate machinery, and other facilities for watchmaking over other parts of Switzerland. In some of the mountain districts, for instance the Vallée-du-Lac-de-Joux, even there you will find watch-factories furnished with the most improved machinery, and running by steam power. Where on the face of the globe can such wonderful specimens of complicated pieces, such as repeating and perpetual calendar watches, etc., etc., be found as are made in that Vallée? And how, I would ask, could they be produced without the aid of machinery of the most elaborate kind?

In the face of these facts, I would ask: Is it not the very height of injustice to allow your remarks upon watch machinery in America (quoted above) to be published to the world? Can the public at large be accurately informed on the subject of the watch industry of different countries by perusing your advertised speech? or, can practical men of this or any other country derive any useful knowledge from it? And if it falls into the hands of those who have made the science of horology a life study, what would they do but put on a smile of incredulity and ridicule, when they read what you say about the adjusting of watches in America; for your words seem to convey the idea, if not to absolutely assert, that they possess the happy faculty of bottling up, as if by enchantment, all the different adjustments, even that freaky element in the hairspring (isochronism), and that they can be sprinkled about at will amongst watches, from the first down to the fifth grades.

There is too much of the mountebank nostrum about this to require serious comment. You cannot very well complain that I have overdrawn the above picture, for you say: "They arrive at the regulation of the watch—so to say—without having seen it." You claim to be a manufacturer, and you must therefore concur with me when I state, that the regulation of a new watch includes all the adjustments.

I will now say a few words in reference to your statement to the effect that the Canton of Neuchatel has injured its reputation by sending cheap goods to the United States. I will at once admit the truth of your words in this particular, but I cannot do so without making some explanation.

It is a well known fact that there has, of late years, been a demand in America for a cheaper article, especially in ladies' watches, than could be furnished by the home companies. Some dealers found that they must have watches in gold cases, that they could sell for $18 and $20, also watches in silver cases that could be sold at retail for $5, $6 and $7. The Canton of Neuchatel responded to this call, and the goods were made and sent. This same thing has been continued for years, and is being done to this day. Who but the American people are to blame for this?

But now, after considering these facts, I will continue by stating that America, as well as other countries, has also called for a better watch than could be found at home, and Switzerland has, to her honor and credit, always been, and is now, responding, by sending such goods as *cannot* be made in any other country *at any price.* I can assure you, that this will not be disputed for a moment by competent judges, either in England or the United States.

Take, if you please, the highest cost watch made in America, and compare it, piece by piece, with even the medium grades made either in Geneva or Locle. You will find both are made by machinery, the die, the millingtool, the lathe, etc., etc., have all played their part in one and in the other. In the case of the American production, the work on the movement ends when the machines have got through, where on the contrary much of the work on the Swiss watch only commences when the machines leave off. Just here is where skilled labor steps in, and by means of dexterous manipulation, the work of finishing is carried to a degree approaching the marvellous.

If any one, through ignorance or prejudice, should dispute these truths, let him take, for example, an anchor escapement from even the medium grades of Geneva watches, and place it by the side of one of the highest grades of American manufacture; the contrast will be too great to allow even the first word of dispute. The first is a wonderful work of art, and the other without even an apology for finish. The feeble excuse is sometimes advanced by the pretensions that all this elaborate finish is unnecessary, and that it does not add anything to the good performance of the watch. This, however, is too absurd to require a denial; but I will simply say that if this point should be granted them, then, to say the least, they are taking pay for work which they have left undone, and their plea is that it is good enough.

I would like to make a few comments upon the statistical portion of your speech, but I will defer it for the present, inasmuch as my letter has already extended beyond the limit to which I intended to carry it when I commenced.

Hoping to hear something from you in reply, I am,

Very respectfully yours, ALBERT H. POTTER.

Vulcanite Jewelry Co.

MANUFACTURERS OF

WHITBY JET,

Combination Whitby Jet and Vulcanite,

Byron's Patent, May 18, 1869,

Also a full line of Lockets—plain, gold mounted and monogram.

No. 191 BROADWAY, N. Y.

☞ Agents for the NEW RUBBER WATCH CASES, Fitting all American Movements.

CHARLES KNAPP,

Engraver, Diesinker and Stamper

FOR JEWELRY PURPOSES.

Manufacturer of Shanks and Heads for Seal and Diamond Rings.

Sample Cards always on hand.

☞ Superior Carved and Fancy Band and Children's Rings, with very elaborate designs, a Specialty.

☞ Fine Engraving and Enameling Work done.

41 Maiden Lane, N. Y.

DAVID PRINCE,

Gold and Silver Refiner,

Assayer and Sweep Smelter,

63 RAILROAD AVENUE,

NEWARK, N. J.

Sole Agent for Comins' Improved Amalgamators

Mansard English Geneve Louis XV.



HENRY LEFORT,

Stem-Winding Watch Crown Manufacturer,

Crowns and Pushers in gold, all sizes, quality and color, made to order. Silver crowns and pushers always on hand.

☞ Samples sent on application.

80 & 82 Marshall Street,

NEWARK, N. J.

HENRY ZIMMERN,

IMPORTER OF

Watch Materials,

TOOLS, GLASSES, SILK GUARDS,

Spectacles & Eye Glasses,

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FIRST FLOOR.

Sole Importer of the A. Hugenin & Gravier Mainsprings

Solid Gold Rings.

TO THE TRADE

For the past twenty-seven years I have made the manufacture of PLAIN GOLD RINGS a Specialty, and have given to every branch of the business my personal attention. I am, therefore, able to sell at the LOWEST CASH PRICES, and in every case guarantee the quality. I will send to any address, with proper reference, from 50 to 500 dwts, net cash, the goods to be returned if not found satisfactory. I also make Children's Rings, Silver Rings and Half-round Chased Rings. For uniformity, and the convenience of my customers, Allen's U. S. Gauge has been adopted as the standard in my manufactory. Parties desiring Single Rings can have them forwarded upon payment of 25 cents extra. Orders for all other jewelry filled at the Lowest Cash Prices. Old Gold received and refined, and $1.03 in gold allowed per pennyweight. Yours respectfully,

J. R. WOOD, Office, 14 John St., N.Y.

Particular attention paid to Remounting. Price list furnished on application.



Full line of new and original mountings on hand.

The Morse Diamond Cutting Company,

OF BOSTON.

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J. D. YERRINGTON, Agent.

☞ Rough, Boart, Cabinet Specimens, Roses and Brilliants constantly on hand, and for sale.

☞ Fractured Diamonds repaired or recut for the Trade; also Rough Diamonds cut and fashioned to order.

Leon Jeanne. Paul Jeanne.

JEANNE BROTHERS,

MANUFACTURERS OF

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Patentees of Jeanne's Ear Wires,

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Designs furnished and estimates given.

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Improved Gold and Silver

THIMBLES



AND THE PATENT

AUTOMATIC EYE GLASS HOLDER,

Which returns the Eye Glasses to their place on or under the lapel of the vest by simply casting them from the nose, combining all the conveniences of Cord, Hook and Case, without their annoyances.

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CAMEO Likenesses,

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MOROCCO, VELVET, SATIN

Jewelry and Silverware Cases,

Rosewood and Black Walnut Trays,

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SPECIALTIES:

STONE AND STONE CAMEO RINGS.

☞ Presentation Medals and Badges of all kinds made to order.

VOSE & SOUTHWICK,

Manufacturers of Gold Jewelry



Sole Makers of the Separable Sleeve and Collar Buttons in Gold.

No. 183 Eddy Street, PROVIDENCE, R. I.

BOURQUIN BROTHERS,

Manufacturers and Importers of Watches,

All Kinds of



WATCHES Made To Order

NO. 20 MAIDEN LANE, N. Y.

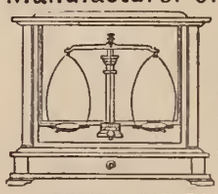
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Solid Gold Rings

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Viz., Plain, Chased, Engraved, Enameled, Engine Turned, Shield & Scale. *All qualities Warranted*

Orders Promptly Executed.

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Diamond, Pearl and Cameo Mountings

A SPECIALTY.

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☞ Designs furnished and estimates made. Particular attention paid to remounting.

W. H. LUDEMAN,

Chronometer & Watch

MAKER,

Nos. 75 & 77 Nassau Street,

NEW YORK.

☞Repairing of every Description for the Trade.

FINE WATCHES A SPECIALTY.

To the Trade.—I am now prepared to cut all kinds of Stem-Winding Wheels for the Trade.

F. W. C. Nieberg,

Repairer and Adjuster of

FINE WATCHES,

and Marine Chronometers,

No. 8 John Street

New York.

Blancard & Oberlander,

Manufacturers of all kinds of

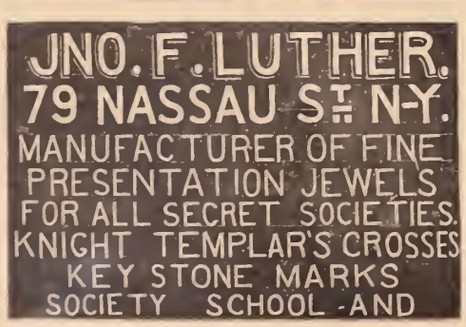
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Of any Carats of Gold, Silver or Platinum,

36 & 38 John Street, New York

We respectfully call attention to our Platinum-lined Settings, as we refine and melt Platinum ourselves. Platinum scraps purchased or exchanged. ☞Please send for sample cards.





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CHAS. T. MENGE,

MANUFACTURER OF

Fine Hair Jewelry

And Device Work,

No. 32 John Street, New York.

Pattern books constantly on hand for the Trade

O. SCHWENCKE,

(Established over 30 years.)

[Successor to G. GUNZENHAUSER],

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Fine Hair Jewelry,

No. 43 MAIDEN LANE,

New York.

Solid Gold Mountings for Hair Jewelry, kept constantly on hand, and made to order at shortest notice.
Orders from the country trade promptly attended to.

☞Coral and Black Onyx Goods

SAMUEL LAWSON,

Manufacturing Jeweler,

AND IMPORTER OF CORAL,

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☞Also make a specialty of

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ALBERT FRIEDENTHAL,

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WATCHMAKERS' & JEWELERS'

Materials, Tools and Optical Goods

Real and Imitation Stones,

☞For Manufacturing and Repairing Purposes

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Agent for Tisdale's Watch and Clock Oils.

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JEWELLERS' PIN VISE.



The tool is made of Steel throughout, with the jaws and wearing parts hardened. Every part is made to guage. The finish is first-class and nickel-plated. Warranted to outwear at least three of the imported pin vises.

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☞Samples securely packed and sent post paid for $1.50 Satisfaction guaranteed or Money refunded.

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Watch Case Spring.

Each holder is accurately fitted to the Case, and in a few minutes the Spring can be adjusted. The Spring works evenly from end to end, and without strain or wear to the most delicate Case.

☞ The Spring is made of the Finest Steel, Drawn and Rolled Hard, which gives it sufficient temper, and so adjusted to the Holder that it retains its elasticity, is not liable to break, and is superior to all others, because it is adjusted to the Case without drilling new holes, as is frequently done with the old Springs. ☞$1.50 per dozen.

C. W. WADSWORTH, PEEKSKILL, N. Y.

ABBOTT'S

Patent Winding & Hand Setting Attachment

FOR

American Watches



Henry Abbott,

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11 Maiden Lane,

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Factory,
13 and 15 Franklin St.
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Can be applied to all full plate 18 Size American Watches. Price, including fitting, $6.00. Discount to the Trade.

☞Watch Wheels cut to order. Send sample wheel by mail.

☞Watches of any kind altered from Key to Stem-Winders. Prices furnished on application.

W. F. TREWIN,

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—AND—

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This periodical is under the supervision of a body of watchmakers, who have correspondents in the kindred branches of industry and sciences, who contribute the leading articles of interesting subjects and illustrations, publishes the reports of the different commercial and industrial societies, of which it is the organ, and is, owing to its great circulation all over the world, a valuable advertising organ.

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A fortnightly Journal for Watch and Clockmakers, Gold and Silversmiths, Electroplaters, Cutlers, Opticians, and all branches of the Precious Metal Trades.

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Allgemeines Journal der Uhrmacherkunst.

Illustrirte Fachzeitschrift fur Uhrmacher.

Redacteur, Emil Sohneider, Uhrmacher in Naumburg, Germany.

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The cut shows Bean with pencil or watch key, made in a substantial manner.

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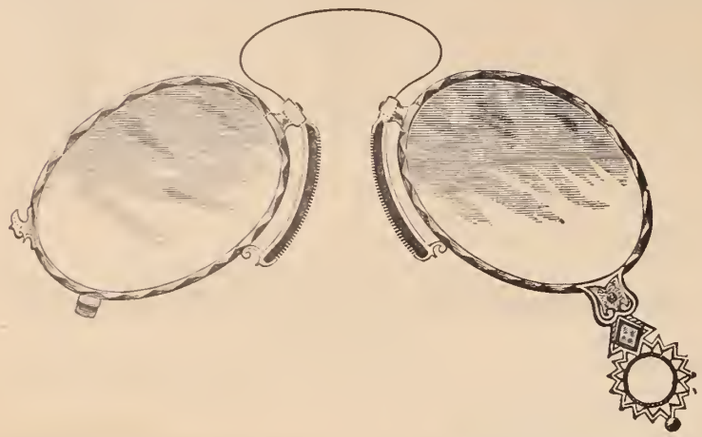
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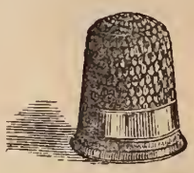
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☞CELLULOID EYE GLASSES in new and desirable styles; the lightest and strongest material ever in use; representing Tortoise Shell, Jet and Amber. These goods are *now* mounted with metal springs. It is much more durable than shell or rubber; will not turn gray; has no sulphur in it, consequeutly will not tarnish jewelry, etc. Twenty-five pairs of the frames only weigh one ounce.

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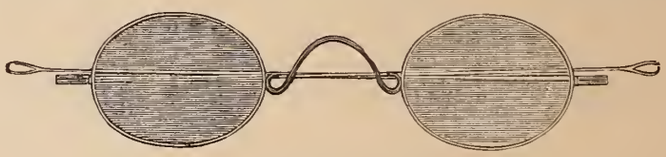
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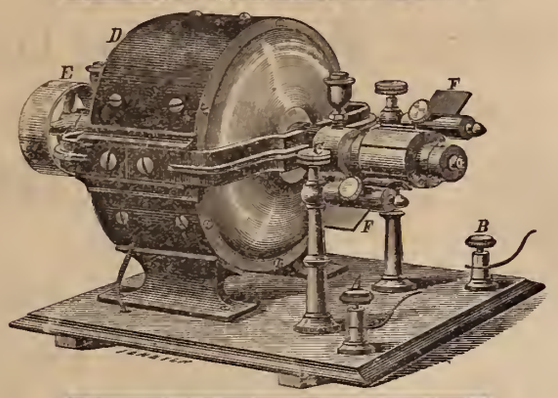
ESTABLISHED 1868

New York, June, 1878.

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C. G. ALFORD & CO.

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CONDIT, HANSON & VAN WINKLE
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Machines for Electro-Plating, Electrotyping, Electric Light, Telegraphing, &c.

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GENTLEMEN: You may send the two machines as proposed. I will say in regard to them they are splendid machines, and will say to any party you may refer to us that I shall advise them to take no other at any price, as yours is the best in my judgment, as we tried one, kept it, and took out all our old machines and replaced them with two of yours (making three 12 inch machines in all). Just say to your customers we refer you to the largest Plating Works in the world. Yours truly,
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Williams & Cook's Dust-Proof Watch Keys,

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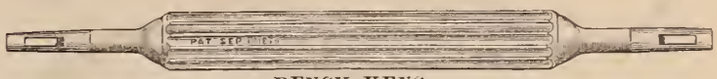
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Corrugated Gilt Handles, Tempered Steel Pipes, per Set of Six.....$1 80
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Gilt Handle. Steel Pipe.



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Our Key Pipes are all warranted to be made of the finest quality of steel. One great advantage this key has over all others, is the mortice through the pipe, making it the most simple and thoroughly dust and moisture-proof, as well as the cheapest key in the market. Our sizes run from 1 to 12; 4. 5 and 6 fit Gents' American Watches; No. 8, Ladies' American.

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☞ The advantage of our Name Key, as an advertising medium, will at once be seen.

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French, Swiss, German & Sheffield Tools, Files,

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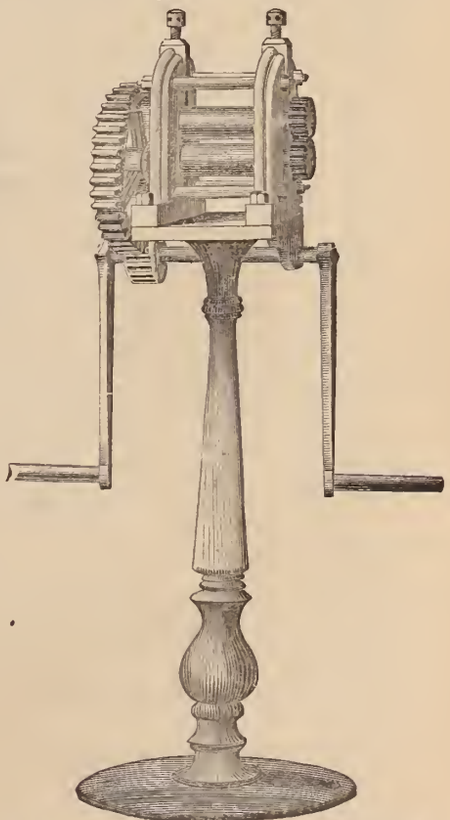
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Established 1816. P. O. Box 4627.

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WANTED—A nice and thoroughly reliable second hand Regulator. I will pay cash or give a fine chronometer in Exchange. Volney S. Cooper, Princeton, Ill.

JOSEPH HOEY & CO., No. 658 Broadway, New York, Photo-Wood Engravers,—each article engraved immediately from the photograph. The best and only reliable method.

FOR SALE—A watch and jewelry business in one of the best towns in Kansas, population about 3,000. Stock $1,2 0, new Only one other shop in town. Sickness the reason for selling. Address Watchmaker, Lock Box 604, Olathe, Kansas.

PERMANENT situat on wanted by an experienced practical Watchmaker, thoroughly acquainted and master of every branch of the trade. Competent to act as salesman, speaking English, German and French. Address, C. H., Jewelers' Circular.

FOR SALE—A well established jewelry business of over nine years standing, in a town of 2,000 inhabitants, county seat, in the State of Kentucky, three to four thousand dollars cash required. For further particulars address J. S., Jewelers' Circular.

WANTED, by a first-class General, Letter, Monogram and Ornamental Engraver, a position as Salesman and Engraver. Can furnish the best references for honesty and capacity. Address, Monogram, office of Jewelers' Circular.

J. C. SAWYER—Manufacturer of Gold and Plated Jewelry, Rings, &c. Orders by mail will receive prompt attention. Goods sent on selection to any part of the U.S. on receipt of N, Y. City references. Address all orders to J. C. Sawyer, Yonkers, N. Y.

$25. REWARD—To the person who will inform M. Garver, Nevada City, California and help him in getting his watch, stolen from him in San Francisco. Gold magic case, English lever. W F. Leece. Great Sutton street. London. No. 24388.

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FOR SALE.—A Jewelry Store, with a small well selected stock, in a thriving little railroad city of Southwest Mo. Good trade and plenty of work. Business well established. Just the place for a good workman. Work will soon be commenced at this point on another railroad. My eyes are failing, and I must quit my trade. Will offer an inducement to a buyer. Address, Watchmaker, P. O. Box 133, Lebanon, Laclede Co., Mo.

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Messrs. Taylor & Bro. introduce a new line of marble clocks of recent importation. Novelties for the Fall trade will shortly be announced.

Hall, Elton & Co., manufacturers of electro-plated ware, are introducing elegant and substantial styles of spoons, forks, etc., which attract considerable attention.

George W. Shiebler, manufacturing silversmith, has removed from No. 4 to No. 6 Liberty Place, second floor, for the convenience of buyers and the better display of goods.

The Dueber Watch Case Manufacturing Co. are increasing their manufacturing facilities by building an addition of some 70 feet, three stories high, to their already imposing establishment.

Bartens & Rice, importers of watches, are the sole agents in the United States for Nicole, Nielsen & Co. London Watches, the best English watches in this market. These movements have a world wide reputation for fine time-keeping qualities.

Messrs. Max Freund & Co., importers of watches, jewelry and precious stones, have bought out the plant of Samuel Smith, 4 Maiden Lane, and have gone into the manufacture of jewelry. They will devote their energies to the production of a wide range of gold goods, embracing sets, lockets, etc., in Roman Etruscan work of the latest design and pattern.

D. Lichty & Co., of Philadelphia, are making a very attractive line of gold and silver watch cases from original designs. Their stock embraces the most desirable styles of merchantable goods. This enterprising house are also importers of Swiss and dealers in American watches. Dealers in search of attractive goods in this line would do well to call and examine their stock

Buyer's Directory.

A Guide to the prominent Wholesale Houses in the Watch, Clock, Jewelry and kindred branches of Trade in New York, Philadelphia, Chicago, Providence and Newark.

NEW YORK.

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Bissinger, Philip—Importer of Diamonds, Pearls and Precious Stones. Sole Agent for the Bohemian Garnet Jewelry, 22 John St.

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Seth Thomas Clock Co. Manufacturers of Clocks of all kinds. Salesroom, No. 581 Broadway,

Ansonia Clock Company.—Nos. 19 & 21 Cliff street, and 5 Cortlandt street, N, Y.

Waterbury Clock Co.—M. Bailey, Treasurer, Manufs. and Jobbers, No. 4 Cortlandt Street, N. Y., and No. 197 State Street, Chicago.

Corals and Coral Jewelry.

Errico Bros.—Importers of Coral, Conch-Shell and Silver Filigree Jewelry, etc., 19 John St.

Granberry, T.—Specialty, Coral repairing for the trade, at reduced prices. Manufacturer of Coral and Black Onyx Jewelry. No. 51 Nassau street.

Lawson, Samuel.—Manufacturer of Fine Gold & Coral Jewelry; Coral Jewelry altered, refinished and repaired, No. 63 Nassau St., N. Y.

Cameo Cutters, Etc.

Bonet, L.—(Successor to Bernerd & Bonet), Cameo Likenesses, 599 Broadway, N. Y.

Habermeier & Wiederer—Engravers of Cameo Likenesses, Seal Stones. Cameos repaired. 23 John St.

Zwetsch, L.—Cameo Engraver. Likenesses cut from Photographs. No. 42 John street.

Charms & Gold Watch Keys.

Rupp & Held,—Manufacturing Jewelers, Charms and Gold Watch Keys, with French and English Ratchets, a specialty. 15 John st., N.Y.

Cutlery.

Harrison Bros. & Howson,—Manufacturers of Fine Ivory and Pearl Table and Pocket Cutlery. No. 26 Cliff street. W. C. Burkinshaw, Sole Agent.

Diamonds.

Anderson, Otis,—Diamond Broker and Commission Merchant. No. 9 Maiden Lane.

Bernhard, A. & Co.—Manufacturing Jeweler & Importers of Diamonds and Precious Stones, also Diamond Mountings, No. 169 Broadway, Gilsey building.

Bissinger, E—Importer of Diamonds, No. 192 Broadway. New York.

Bissinger, Philip—Importer of Diamonds, Pearls and Precious Stones. Agent for the Bohemian Garnet Goods No 22 John St., N.Y.

Buckenham, Cole & Saunders—Importers of Diamonds and other Precious Stones, No. 10 Maiden Lane, N. Y.

Fera, Henry—Importer of Diamonds, and Manufacturer of Fine Diamond Jewelry. No. 9 Maiden Lane, New York. Amsterdam, Holland, 23 Loojersgracht.

Herbert, R. J.—Importer and Broker in Diamonds, 24 John Street.

Morch, Jacob—Importer of Diamonds, Pearls, French & Italian Stone Cameos, Amethysts, Onyxes, and Precious Stones. Diamonds in pairs a specialty. No. 25 Maiden Lane, N. Y.

Neresheimer, E. Aug.—Importer of Fine Diamonds. No. 21 Maiden Lane, New York.

Diamond Cutters.

The Morse Diamond Cutting Co. of Boston.—Henry D. Morse, General Manager. N. Y. Office, 192 Broadway, corner John street. J. D. Yerrington, Agent.

Diamonds and Diamond Jewelry.

Bissinger, Philip.—Importer of Diamonds, 22 John street, N. Y. Agent for the Bohemian Garnet Goods.

Bornemann, Louis—Manufacturer of Diamond Jewelry from original designs, 169 and 171 Broadway.

Heller & Bardel—Manufacturers of Diamond Jewelry, and Dealers in Diamonds, No. 13 John street.

Smith, Hedges & Co.—Importers of Diamonds Exclusively, and Manufacturers of Fine Diamond Jewelry, 1 Maiden Lane.

Taylor & Brother—Importers of Diamonds and Diamond Jewelry, 676 Broadway.

Diamond Setters, Etc.

Asher, J.—Jeweler and Diamond Setter, Precious Stones Inlaid and Incrusted with Diamonds, Nos. 880 and 882 Broadway.

Blancard & Oberlander—Manufacturers of all kinds of Settings and Galleries of any carat of Gold, Silver, Platinum and Platinum Lined. Send for sample cards. 36 and 38 John street, N. Y.

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Dials, &c.

Caesar Brothers—Manufacturers of Enameled Clock Meter and Gauge Dials, Patent Door, Coffin and Pew Plates, Druggists' Labels, &c. No. 32 and 34 John Street.

Gold, John T.—(Successor to the late T. Gold), Enamel Watch Dial Maker, 81 Nassau St.

Enamelers, Etc.

Nutt, J. D.—Enameler on Gold, Silver and Copper, 32 and 34 John St. Birds, Flowers, etc., Enameled in colors.

Orr, Jas. C.—Enameler on Fine Jewelry, Flowers, Birds, &c., Enameled in colors. Band Bracelets (a specialty). 77 Nassau Street.

Engravers and Die Sinkers

Fackner, Edward—Carver, Engraver and Chaser on Jewelry and Pencil Cases. Monograms Lettering, &c. 19 John Street.

Knapp, Charles—Engraver, Die Sinker & Manufacturer of Band Rings. 14 and 18 kt. Shanks and Heads for Rings, &c., 41 Maiden Lane.

Schuller, J. Dan'l—Stone Seal Engraver, Arms Crests, Initials and Monograms engraved on Stone Seals, &c. 71 Nassau street.

Fancy Goods, Clocks, Bronzes, Etc.

Hinrichs, C. F. A.—Importer and Dealer in French, English and German Fancy Goods, etc., etc. 29, 31 & 33 Park Place, N. Y.

Magnin, Ve J. Guedin & Co.—Importers of Clocks Bronzes, Musical Boxes & Rich Fancy Goods etc., 652 Broadway.

Le Boutillier & Co.—Importers of Fancy Goods, Clocks, Bronzes, &c. 3 Union Square.

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Beck, J. & Son, Manufacturers of Fine Gold Chains and Chain Bracelets, 10 Liberty place, near Maiden lane, N. Y.

Dorrance, Edge & Co.—Manufacturers of the Celebrated Woven Fabric Gold Chain, No. 9 John street.

Hamiltons & Hunt.—Manufacturers of Fine Plated Chains and Patent Buckle Bracelets. Branch office, 176 Broadway. Factory, 226 Eddy street, Providence.

Kaufmann Bros.—Manufacturers of Gold Chains, and Chain Bracelets, 26 John street; Factory, 331 and 333 Bowery, N. Y.

Nord & Schlag,—Manufacturers of Gold Chain. No. 366 Broome St., N. Y.

Saxton, Smith & Co.—Manufacturers of Fine Gold Chain. 194 Broadway.

Gold Pens, Etc.

Aikin, Lambert & Co.—Manufacturers of Choice Gold Pens, Cases, Holders, Toothpicks, etc., 12 Maiden Lane, N. Y.

Mabie, Todd & Bard—Manufacturers of Gold Pens, 180 Broadway.

Todd, Edward & Co.—Manufacturers of Gold Pens, Pencil Cases, Tooth Picks, &c., 652 Broadway, N. Y. Factory, Brooklyn.

Goldsmiths, &c.

Greene, Wm. C. & Co.—Goldsmiths; Manufacturers of Rich Sets in Taper Wire Coral. Office, 18 John street.

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Ely, W. H.—Manufacturer of Solid Gold Rings of every description. No. 58 Nassau Street.

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Dahlem, W.—Manufacturer of Cases for Jewelry and Silverware, No. 85 Nassau Street, N. Y. Show Case Trays, &c., at the shortest notice.

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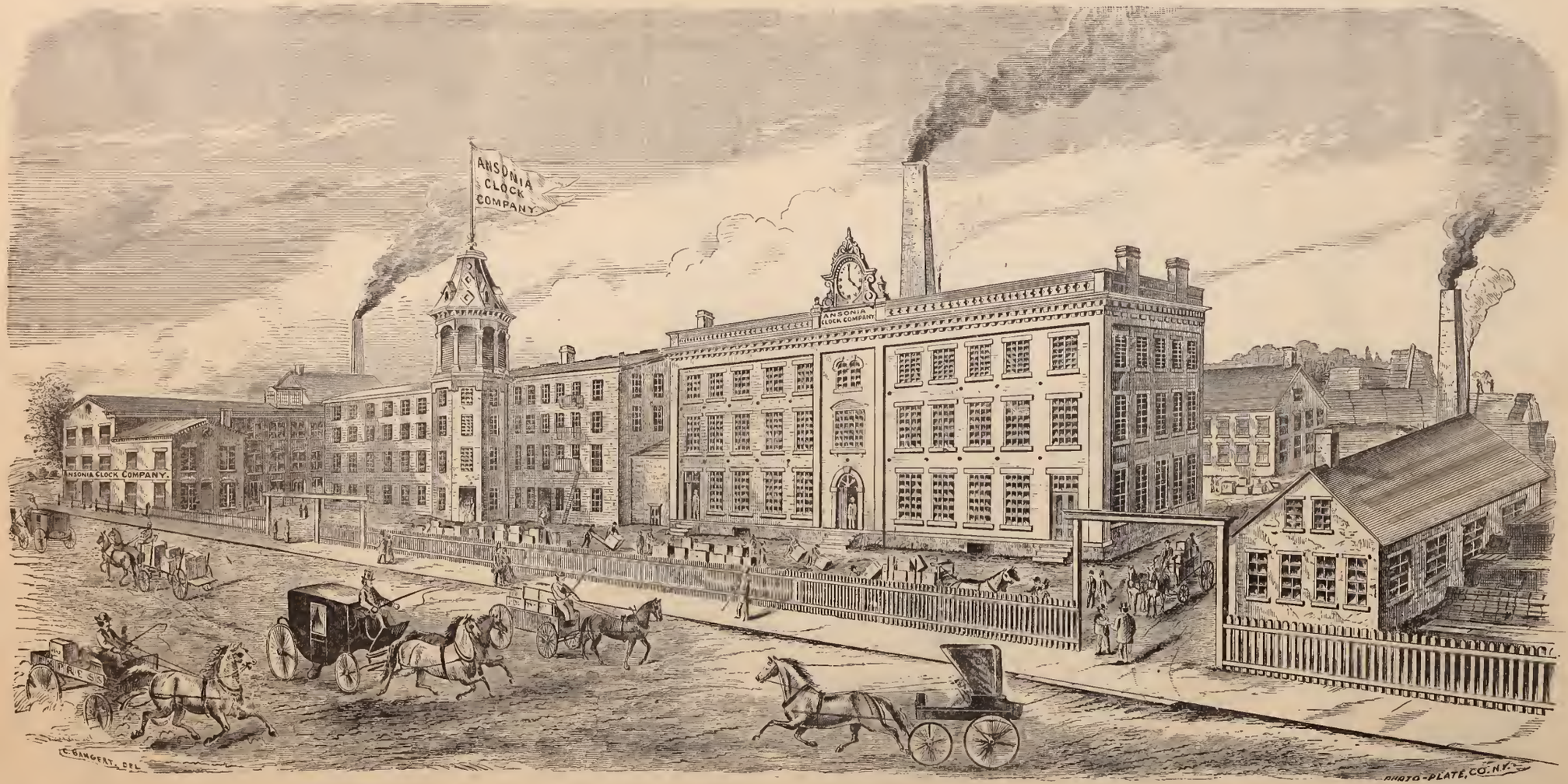
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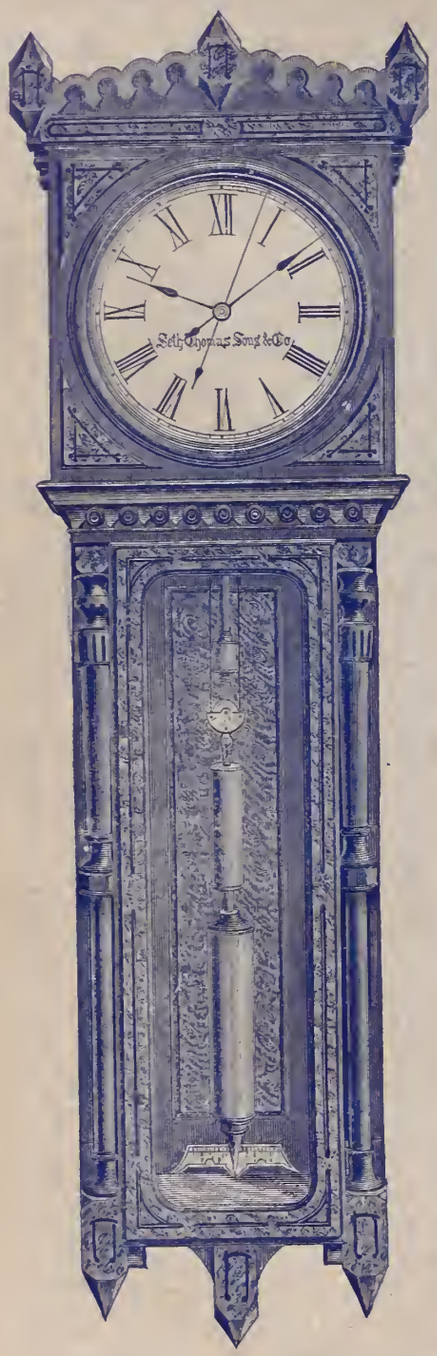
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A Small Lever Time-piece

WINDS, SETS AND REGULATES

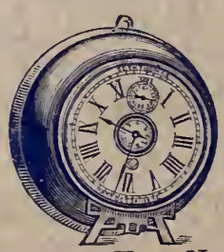
AT THE BACK.

HANGS UP OR STANDS UP.

WINDER ATTACHED TO CLOCK.

Scale, One-Quarter Size, 3 inch Dial.

"NUTMEG" ALARM LEVER.
Front. Back.





30 Hour Nutmeg Alarm, Brass.
30 Hour Nutmeg Alarm, Nickel.

AMERICAN CLOCK CO., (Hine & Thomas.)

Ansonia Clock Company,

MANUFACTURERS OF AMERICAN CLOCKS,

And IMPORTERS of CLOCKS of EVERY DESCRIPTION.

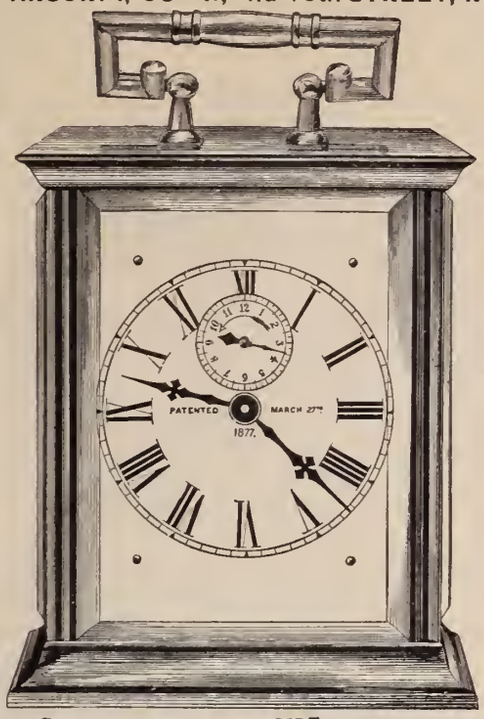
SALESROOMS: 19 & 21 CLIFF STREET, and 5 CORTLANDT STREET, (Near Broadway NEW YORK.

FACTORIES ANSONIA, CONN., and 10th STREET, NEW YORK.



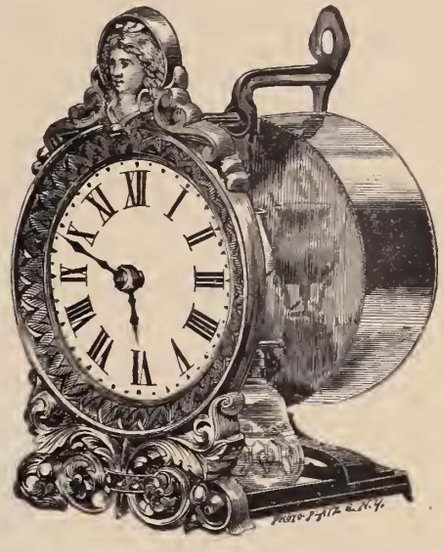
Peep O'Day Alarm.

One-half the size: Stem-Winding: Sets the alarm and winds at the back. "Only requires one spring" to be wound, and will go in any position.



CARRIAGE. Stem-Winder. Nickel or Gilt.

One Day Time, Alarm. No. 1, height, 5½ in. Eight Day Time. No. 2, height, 4½ in. Only one spring to wind. No. 3, height 3½ in.



Aladdin Night Light, Extra.

Nickel and Gilt. Stem-Winder. Patented November 1, 1877. One Day Time. Four inch dial. Height, 7 inches.

The above are excellent Time-keepers. Illustrations and prices on application.

A NEW LINE OF NOVELTIES WILL SHORTLY BE OFFERED.

Waterbury Clock Comp'y

Manufacturers and Jobbers of AMERICAN CLOCKS,

"Cricket." No. 4 Cortlandt St., New York. **"Sunrise."**

30 Hour Lever Time Piece. **30 Hour Lever Time Piece, Alarm**

197 State Street,
CHICAGO.
113 Sansom Street,
SAN FRANCISCO.
Factories, - - Waterbury, Conn.

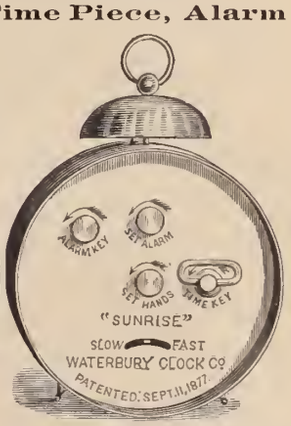
M. BAILEY, Treasurer.





ONE-THIRD ACTUAL SIZE.





ONE-THIRD ACTUAL SIZE.

"CRICKET" & "SUNRISE"

Are Stem-Winders, No Keys Required, Reliable Time-Keepers, Will Run in any Position, Separate Alarm Spring, Set and Regulate at the Back. Nickel-Plated Cases.

SOLE AGENTS FOR THE ITHACA CALENDAR CLOCK COMPANY.

Illustrated Catalogues and Price Lists furnished to the Trade upon application.

THE NEW CLOCK!

LA BELLE.

THIRTY HOUR LEVER TIME.

THIS CLOCK WILL RUN

In any Position!

—o—

Is a Stem-Winder.

—o—

WINDS AND SETS

EVERYTHING

At the Back.



(THIS CUT IS THE EXACT SIZE OF THE CLOCK).

THE MOVEMENT IS PROTECTED

AT FRONT AND BACK

By Close Fitting Caps,

SO THAT THE

DUST

CANNOT GET IN!

PRICE, GILT, GOLD OR NICKEL, $4.00: ALARM, 4.50.

☞ *Also a full assortment of Clocks of the following manufacturers:*

E. N. WELCH M'FG CO. **WELCH, SPRING & CO.**

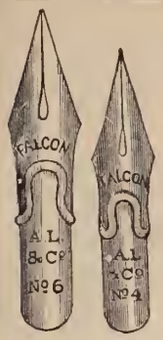
ATKINS CLOCK COMPANY.

AT FACTORY PRICES!

Bristol Brass & Clock Company,

No. 32 Warren Street, New York.

GEORGE W. BROWN, Agent.



J. C. AIKIN, H. A. LAMBERT, J. B. SHEA.

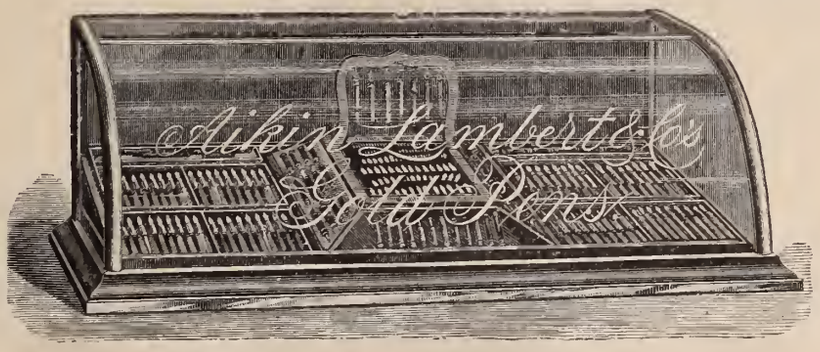
AIKIN, LAMBERT & Co.,

MANUFACTURERS OF

Gold Pens, Pencil Cases, Holders, Pencils, Picks,



And RELIABLE JEWELRY in great variety.



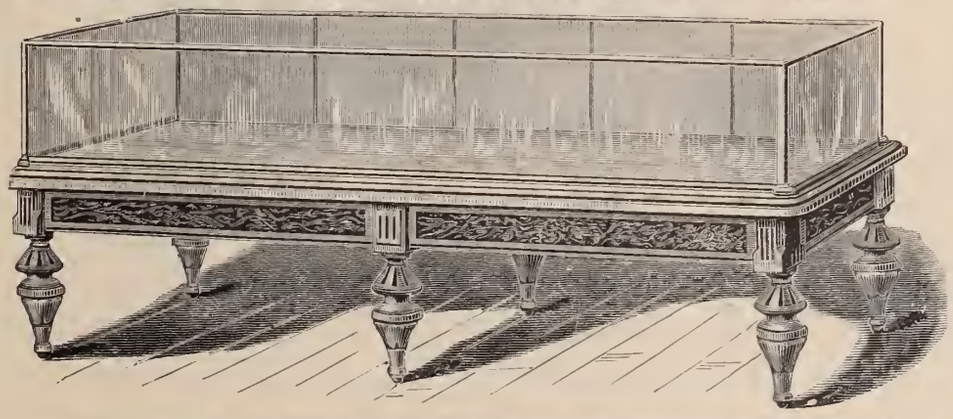
Our system of furnishing Show Case assortments, and establishing agencies, is broad, liberal and advantageous, and, as the originators of that method of display, now so popular with the Trade, we are offering liberal inducements to Agents. Prices recently reduced.

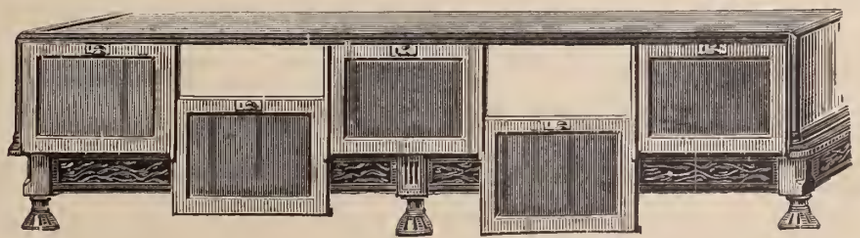
Illustrated Catalogues and Price Lists furnished upon application. Correspondence invited. Goods sent on approval when desired.

No. 23 MAIDEN LANE, NEW YORK.

PATENT IMPROVEMENT IN COUNTER SHOW CASES,

PERPENDICULAR SLIDING DOOR, DUST-TIGHT.





REAR VIEW OF CASE SHOWING SLIDING DOOR.

Its advantages are as follows:—The doors are more conveniently opened and closed, less liable to get out of repair or broken, articles are more easily reached in wide cases, mirrors are more safe, it dispenses with hinges, economizes room, excludes dust, and is air tight *when closed*.

☞ Drawings furnished and estimates given for fitting stores in cabinet work complete.

REFERENCES:—Gorham Mf'g Co., Rogers & Bro., Mitchell, Vance & Co.
Meriden Britannia Co., M. S. Smith & Co., Detroit, Mich.
D. Valentine, Syracuse, N Y.

B. & W. B. SMITH,

220 West 29th Street, New York.

The Meriden Britannia Company,

UNION SQUARE, NEW YORK,

ARE MANUFACTURING AND HAVE ON EXHIBITION A CHOICE SELECTION OF DESIRABLE ARTICLES IN

FINE SILVER-PLATED WARE,

Combining every Modern Improvement in Plating and Elegance of Design, with Sterling Quality, and offer to the Trade the most Extensive and Attractive Assortment ever presented in this country. Also, a Large Variety of ORNAMENTAL ARTICLES, suitable for Presents. Our Assortment consists in part of

Spoons, Forks, Table Cutlery, Dinner, Tea and Dessert Sets, Entre Dishes, Epergnes, Castors, Cake Baskets, Ice-Water Sets, Tea and Coffee Urns, Salvers, Communion Ware, &c.

Centennial Medals and Diplomas were Awarded to this Company for "Superior" Silver-Plated Ware.

Extract from Centennial Judges' Report.—"Their large variety of Silver-Plated White Metal Hollow Ware is of excellent quality and finish, and of tasteful designs." "Their Silver-Plated Forks, Spoons and Knives are of superior quality and excellent finish. Their XII Plating, or extra plating on exposed parts, deserves commendation."

Extract from American Institute Report.—"Their Porcelain-Lined, Double-Walled Ice Pitchers are **A 1**, and possess ALL the qualities the company claim." "We consider the goods made by this company to be by far THE BEST made in this country, and we believe in the world."



THE PORCELAIN-LINED ICE-PITCHERS, ANOTHER SPECIALTY.—Valued for retaining the Purity and Coolness of Water, as well as for Durability, Cleanliness and Chemical Excellence of their Interior Surface. The Porcelain is Enameled on Hard Metal and cannot be broken or cracked by rough usage.

"There are many apparent advantages in these li nings, besides those already mentioned, BUT THE ABSENCE OF ANY INJURIOUS MATERIAL in the construction of this inner chamber SHOULD BE THE FIRST CONSIDERATION IN SELECTING A SAFE ICE PITCHER FOR DAILY USE."—S. DANA HAYES, M. D., State Assayer of Massachusetts.

We take much pleasure in referring to the reputation we have for many years maintained for manufacturing SPOONS AND FORKS BEARING THE TRADE MARK, "1847, ROGERS BROS."

Particular attention is invited to our Patented Process of Electro-Plating Spoons and Forks, by which the parts most exposed to wear receive an EXTRA COAT OF SILVER. This feature renders these goods more economical and durable than those of any other manufacture, while the increased cost is relatively small. This method of plating we apply to the 4, 8 and 12 oz. plate, as required.

☞ **First Premiums** Awarded at all Fairs where Exhibited, from the World's Fair, 1853, to American Institute Fairs, 1873, 1874 and 1875, inclusive, and at the Philadelphia Centennial Exhibition, 1876.

Manufactories, West Meriden, Conn. **WAREROOMS, UNION SQUARE, NEW YORK.**

SUPERIOR ELECTRO-PLATE!

MANUFACTURED BY

THE MIDDLETOWN PLATE COMP'Y,

Factories, MIDDLETOWN, Conn.

Salesrooms, 13 John Street, New York.
120 Sutter Street, San Francisco.

SUPERIOR HARD WHITE METAL,

SUPERIOR HEAVY PLATE,

SUPERIOR DESIGNS, WORKS OF ART

Wedding and Fancy Presentation Pieces in Elegant Designs.

Our assortment of Tea Sets, Urns, Butter Dishes, Syrup Cups, Baskets, Pitchers, Waiters, Goblets, Fruit and Berry Dishes is complete in **new designs.**

Our Patterns are Original! **Photographs sent dealers on application!**

SIMPSON, HALL, MILLER & CO.

Fine Electro-Silver Plated Ware,

Factories, Wallingford, Conn. Salesroom, No. 676 Broadway, N. Y.

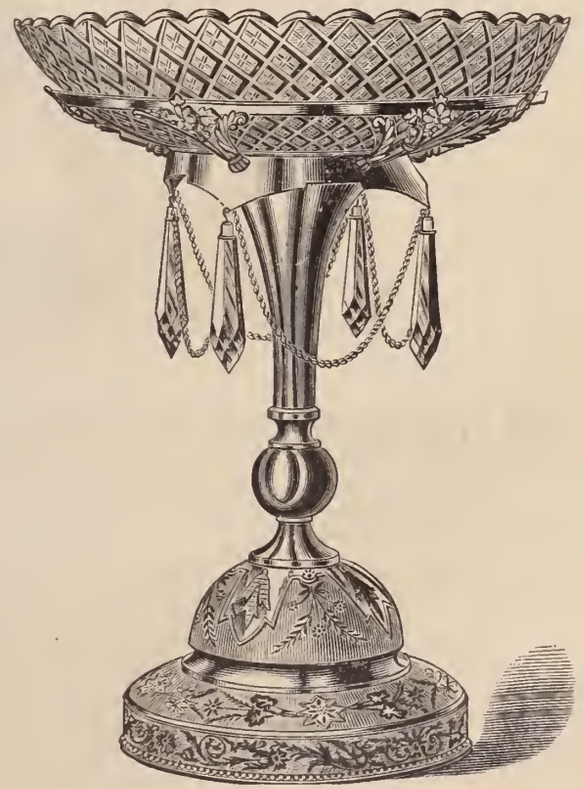
One of the oldest and most reliable manufactories in the country.

Our Solid Table Ware is made of the Best Nickel Silver.

Spoons, Forks, Ladles, Pie Knives, &c.

IN GREAT VARIETY OF PATTERNS.

Solid Steel Knives, superior article and Heavily Plated for Service.



OUR HOLLOW WARE consists of Tea Sets, Urns, Tea Trays, Spoon Holders, Milk and Water Pitchers, Butter Dishes with glass plates, Cake Baskets, Biscuit Bowls, Berry Dishes, Fruit Stands, Pickle and Jelly Dishes, Dinner and Breakfast Castors, Oyster and Soup Tureens, Baking Dishes, Steak Dishes, Vegetable Dishes, Celery and Salad Dishes, Syrup Cups, Tray and Rack for holding Spoons and Forks, also with Call Bell attached (patented). Toilet Sets in great variety of patterns, beautiful glass, richly mounted with silver, Vases, Card Stands combined. The glass Vases are of various patterns and styles; cut and fancy, of the most beautiful designs and mounted in the most elegant silver frames and stands. Centre Pieces and Epergnes, the most elaborate or plain, as desired; in fact thousands of articles in the line of Silverware, and all warranted to be first-class and exactly as represented.

☞ Our facilities being second to none to produce the finest and most serviceable *ELECTRO-PLATED WARE*, at the lowest possible price. By years of experience, close attention to business, and our unsurpassed facilities, we are enabled to produce goods as cheap, if not cheaper, than any other concern in this country, consequently dealers can feel assured that they will always get goods from us at the very lowest price. The pride of our house is to make the finest goods, and sell them at fair prices, and please our customers, by honorable dealings, and retain the reputation which, we believe, is unquestioned as to our making the best of goods and also the cheapest.

PATENT BUTTER DISH.

We have introduced this season an entirely new and novel Butter Dish. The convenience of its opening and closing can but strike one favorably. Its beauty of design and workmanship must please everybody. We have produced other valuable designs and patents in the way of Butter Dishes as well as many other useful articles in our line, but this is the most complete and perfect in its arrangement of anything heretofore produced, and must take the lead of all other first-class Butter Dishes in the market.

DAVID F. CONOVER & CO.,

(Successors to Wm. B. Warne & Co.)

Importers, Manufacturers and Wholesale Dealers in

WATCHES AND JEWELRY.

Silver and Silver-Plated Ware,

American Watch Wholesale Salesroom,

Southeast Corner Chestnut and 7th Sts.,

(FIRST FLOOR.)

David F. Conover,
B. Frank Williams,
C. Edgar Righter.

PHILADELPHIA, PA.

LOUIS STRASBURGER & CO.,

Importers and Makers of Watches,

OF EVERY DESCRIPTION,

From the Finest Stem-Winding and Setting Goods to the Lowest Priced Watch in the Market.

Our Stock is unusually complete and attractive and embraces an assortment of the best Commercial Watches to be found anywhere ranging from $4.00 to $600 each.

We would also call the attention of buyers to our select display of fine Timing and Complicated Watches, Chronographs and Repeaters, of every description, from the establishments of the most eminent makers.

☞ We are also the Sole Agents for the International Watch Co.'s Watch, so well and favorably known in this market.

LOUIS STRASBURGER & CO.,

No. 15 Maiden Lane, New York.

Diamond Bureau,
No. 30 Boulevard Houseman,
PARIS

Watch Factory,
Chaux de Fonds, Switzerland.

GORHAM M'FG. CO.

SILVERSMITHS.

Factories, Providence, R. I.

SALESROOMS,

37 UNION SQUARE, N. Y.

Branch Office, 120 Sutter Street, San Francisco.

Sterling Silverware and the Gorham Plate.

HOLLOW-WARE.—Our manufactures in this important branch are of the widest range, covering all the wants for household use and decoration. Prize and Presentation Sets and pieces for general and specific purposes.

SPOON-WARE.—Complete illustrated sheets of our SPOON AND FORK PATTERNS, with price list, will be furnished to the trade upon application. The Hindostan which has been added to our list the present season has been most favorably received. Its style of ornamentation is, as its name indicates, Indian or Hindostan, equal to the Raphael in beauty of design, smooth to the touch, free from the objectionable feature of sharp edges, and by a judicious distribution of metal the very desirable feature of strength in the shank is obtained, giving the appearance of a much heavier spoon.

FLAT-WARE.—The variety of combinations, suitable for wedding and holiday gifts, range from a single article of trifling value to elaborate combinations of several hundred pieces. New styles of decoration in color has been an attractive feature in the productions of the present season.

CASES.—Elegant and desirable Cases for these varied combinations are of our own manufacture, including Plate Chests substantially made in plain and ornamental wood.

MILLER BRO'S,

MANUFACTURING JEWELERS,

No. 11 MAIDEN LANE, NEW YORK.

Manufactory, 47, 49 & 51 Franklin Street, Newark, N. J.

INITIAL GOODS



A SPECIALTY!

Seals, Lockets, Sets, Sleeve Buttons, Studs, Collar and Chemise Buttons.

ATTENTION IS INVITED TO OUR

NEW STYLES OF ETRUSCAN SLEEVE BUTTONS,

MOUNTED WITH

RUSTIC LETTERS,

BIRDS ANIMAL HEADS AND FANCY ORNAMENTATIONS

HODENPYL, TUNISON & CO.,

MANUFACTURERS OF

Fine Gold Chain and Jewelry.

A FULL ASSORTMENT OF

ROMAN BAND BRACELETS,
ROMAN NECK CHAINS AND PENDANTS,
LOCKETS, SLEEVE BUTTONS,
STUDS, AND CHAIN MOUNTINGS.

OUR STYLES ARE VARIED, NEW AND NOVEL.

Salesrooms, No. 170 Broadway, New York.

☞ Desirable goods for the Export Trade.

CLEMENS OSKAMP,

Manufacturing Jeweler,

And SILVERSMITH,

IMPORTER & WHOLESALE DEALER IN WATCHES,

CLOCKS, MATERIALS & OPTICAL GOODS.

175 Vine Street, CINCINNATI.



TINGLEY, SINNOCK & SHERRILL,

MANUFACTURERS OF

FINE JEWELRY.

5 MAIDEN LANE, *FACTORY, NEWARK, NEW JERSEY*

J. B. & S. M. KNOWLES,

MANUFACTURERS OF

Sterling Silverware

Office, No. 20 MAIDEN LANE,

NEW YORK.

Factory, No. 95 PINE STREET, PROVIDENCE, R. I.

ESTABLISHED 1859.

RINGS A SPECIALTY.

BRYANT & BENTLEY,

No. 12 Maiden Lane, New York.

MANUFACTURE A LARGE VARIETY OF

FINE SOLID RINGS,

For Ladies and Gentlemen, in CAMEO, AMETHYST, OXYN, TOPAZ, TURQUOISE, GARNET and other stones, Fine CAMEO, CORAL and ROMAN SETS of new and handsome designs. LOCKETS, MEDALLIONS, SHAWL and SCARF PINS, SLEEVE BUTTONS, STUDS, &c. All goods warranted.

☞ We continue to manufacture several hundred patterns of **HARD SOLDER RINGS**, in every style, for men, women and children, stamped and warranted 16 carat fine.

AMASA BRAINERD, JOHN W. STEELE, DYER BRAINERD.

BRAINERD, STEELE & CO.,

MANUFACTURERS OF



Brainerd's Pat. Lockets,

(Patented June 17, 1874.)

These Lockets combine both beauty and strength. They are made of solid 14kt. gold, and the stones used are the finest obtainable in the market. They cost no more than those of the old style, if indeed as much; and the combination of secrecy and durability renders them much more desirable. We make three sizes in four different shapes—round, oval, cushion and oblong square; and also Sleeve Buttons of the same style, containing a concealed box for miniatures, a novelty new to the Trade.



FINE GOLD JEWELRY,

No. 9 Maiden Lane,

NEW YORK.

DENNISON & CO.,

MANUFACTURERS OF

Paper Boxes, Jewelry Cards, Tags,

PINK AND WHITE COTTON,

JEWELERS' AND PLATE BRUSHES, SEALING WAX, RUBBER BANDS, &c.

SEND FOR CATALOGUE.

TISSUE PAPERS. Proprietors "Globe," and Centennial Prize "Excelsior," and Importers of English Grass, Bleached and Colored Tissue Papers, from the celebrated 39 mill.

Sole Proprietors of Millers' Specialties!

JEWELRY CASKETS, SILVER WHITE CASKETS, and

SILVER WHITE, the best article for Cleaning Silver and Plated Ware. Samples furnished the Trade for distribution.

DENNISON & CO.,

Boston, New York, Philadelphia, Chicago, Cincinnati, St. Louis.

SAXTON, SMITH & CO.

MANUFACTURERS OF

Fine Gold Chain.

No. 194 BROADWAY

New York.

Factory, No. 183 Eddy Street, Providence, R. I.

☞ **Sole Agents for the new PATENTED CHAIN BAR, containing a Detachable Pencil.**

BUCKENHAM, COLE & SAUNDERS,

SUCCESSORS TO

BUCKENHAM, COLE & HALL,

IMPORTERS OF

Diamonds, Pearls

AND OTHER PRECIOUS STONES,

MANUFACTURERS OF FINE JEWELRY,

10 Maiden Lane, New York.

☞ A large stock of FINE DIAMONDS, Mounted and Unmounted kept constantly on hand. Goods sent on approval to any part of the country on receipt of satisfactory references.

☞ **The Patent 12 o'clock Stem-Winders and Stem-Setters, with Seconds Hand; made to Wind at Figure XII. instead of at Figure III.**

☞ We have also on hand the **Arburndale Horse Timers,** for which we solicit orders



☞ We desire to call the special attention of Watch Dealers and Jobbers to the fact that we have made arrangements with the patentee for the manufacture and exclusive sale of his **Patent Open Face, Full Plate, Stem Wind Attachments,** indicated in the annexed design.

☞ These Stem Wind, and Hand Set Attachments can be applied to the regular 18 size Key Winding Movements, made by the WALTHAM, ELGIN and SPRINGFIELD WATCH COMPANIES, and warranted by us to be both accurate and reliable.

The great increase in the demand for American **Open Face** Watches in the past few years, renders this a very desirable improvement. ☞ When requested we will send samples of these Watches for examination and approval.

J. T. SCOTT & CO., No. 11 Maiden Lane, New York.

Jobbers, Manufacturers & Importers of Watches, Jewelry, Chains, Diamonds, &c.

WOOD & HUGHES,

STERLING

Silverware Manufacturers

No. 16 JOHN STREET,

NEW YORK.

Geo. Krementz. J. A. Lebkuecher.

KREMENTZ & CO.,

Manufacturing Jewelers,

No. 13 John Street,

Factory, 361 MULBERRY ST., Newark, N. J.

NEW YORK.

TRADE  MARK.

WHITING M'F'G COMPANY,
STERLING
SILVERSMITHS,
WORKS & WAREROOMS,
Broadway & Fourth St., New York.
WHOLESALE ONLY.

SMITH, HEDGES & CO.
IMPORTERS OF
DIAMONDS
Which are offered to the Trade, mounted or unmounted.
No. 1 Maiden Lane, cor. Broadway,
NEW YORK.

CARTER, HOWKINS & SLOAN,
Makers of
FINE JEWELRY,
Consisting of Chains, Bracelets, Sets, Pins, Studs, Sleeve Buttons, Rings, &c., in Roman, Etruscan and Enamel.
Whiting Building, Corner Broadway and Fourth Street,
A. CARTER JR.
WM. HOWKINS,
A. K. SLOAN.
NEW YORK.
C. E. HASTINGS,
GEO. R. HOWE.
W. T. CARTER.

Established 1817.
Ve. J. MAGNIN, GUÉDIN & CO.
Manufacturers and Importers,
FINE SWISS WATCHES,
REPEATERS, CHRONOGRAPHS & CALENDARS.
GENEVA GOLD JEWELRY,
FRENCH CLOCKS AND BRONZES,
RICH FANCY GOODS,
HORSE-TIMERS & PODOMETERS,
GOLD AND SILVER CHATELAINE WATCHES.
No. 652 BROADWAY, NEW YORK.
Sole Agents for the James Nardin Watch.
House in Geneva, 14 Grand Quai.

HALE & MULFORD,
MANUFACTURERS OF
RICH JEWELRY,
(WHITING BUILDING),
No. 694 Broadway, corner 4th Street,
NEW YORK.
Stone and Stone Cameo Goods, Rings, Necklaces, Colored and Etruscan Work, Etc.
FIRST CLASS GOODS OF OUR OWN MAKE
EXCLUSIVELY!

BALDWIN, SEXTON & PETERSON
MANUFACTURERS OF
Fine Jewelry,
Diamond and Stone Cameo Goods,
GOLD CHAINS, &c.
Importers of Diamonds, Pearls, Emeralds, Rubies, &c.
WHITING BUILDING,
Cor. Broadway and Fourth Street,
NEW YORK.

WHEELER, PARSONS & HAYES,

MANUFACTURERS OF

Watch Cases, Gold Chains & Fine Jewelry,

AND DEALERS IN

AMERICAN AND SWISS WATCHES,

NO. 2 MAIDEN LANE, NEW YORK.

ENOS RICHARDSON & CO.

MANUFACTURERS OF

FINE GOLD JEWELRY,

Gold Chains, Lockets, Crosses and Necklaces,

COLORED AND ETRUSCAN WORK.

All Goods sold strictly of our own manufacture.

23 MAIDEN LANE, NEW YORK.

ENOS RICHARDSON, L. P. BROWN, F. H. RICHARDSON,
THOS. SLATER, W. P. MELCHER.

ONYX GOODS A SPECIALTY!

JOHN A. RILEY & CO.,

Manufacturing Jewelers,

ETRUSCAN GOLD AND CORAL SETS, ROMAN BRACELETS, NECKLACES, &C.

Nos. 7 and 9 BOND STREET

NEW YORK.

No. 126 Kearny Street, San Francisco, Cal.

Established 1813.

THOMAS G. BROWN,

MANUFACTURER OF

FINE JEWELRY,

NEWARK, N. J.

—AND—

9 BOND STREET, NEW YORK.

MOORE & HORTON,

JEWELERS,

No. 11 Maiden Lane, New York.

SPECIALTIES!

Stone Cameo, Onyx, Amethyst, Topaz and Pearl Rings. Studs, Collar and Sleeve Buttons.

☞Also our new fac-simile of Fine African Diamonds, mounted in Rings, Studs, Pins, Ear-rings, Scarf Pins, Medallions.

Joseph B. Bowden & Co.

MANUFACTURING JEWELERS,

SOLID GOLD RINGS

A SPECIALTY.

A LARGE ASSORTMENT OF PLAIN, CARVED, PLAIN BAND AND CHILDRENS' ALWAYS ON HAND. ALSO A FULL LINE OF CAMEO SLEEVE BUTTONS AND STONE RINGS.

Old No. 11 Maiden Lane, New York.

CARROW, CROTHERS & CO.,

MANUFACTURERS OF

FINE JEWELRY,

No. 12 John Street, New York.

Specialties!

FINE LINKED SLEEVE BUTTONS, ROMAN BAND BRACELETS, LOCKETS & CROSSES.

N. B.—We desire to call the attention of the Trade to our IMPROVED BRACELET CATCH, and our new styles of Link Sleeve Buttons.

Established 1846.

WILLIAM RIKER,

No. 5 Maiden Lane, New York.

Factory, 42 Court Street, Newark N. J.

CHATELLIER & SPENCE,

Manufacturing Jewelers,

652 BROADWAY, NEW YORK.

No. 1129 Chestnut Street, PHILADELPHIA, PA.

No. 12 West Street, BOSTON, MASS.

No. 120 Sutter Street, SAN FRANCISCO, CAL.

CHATTERTON & DODD,

Makers of Fine Jewelry

Consisting of Sets, Pins, Ear-Rings, Lockets, Crosses, Sleeve Buttons, Studs, &c.

No. 19 John Street, New York.

ROMAN, ETRUSCAN AND ENAMEL WORK GENERALLY, SPECIALLY DESIGNED BY US.

COE, PINNEO & STEVENS,

MANUFACTURERS OF

LOCKETS,

WHITE ENAMEL STUDS & BUTTONS,

Linen Finished and

FINE JEWELRY,

Old No. 9 Maiden Lane, New York.



☞ *Diamonds loose and mounted sent on approval on receipt of satisfactory reference.*

Louis A. Scherr. Chas. H. O'Bryon. G. W. Scherr.

LOUIS A. SCHERR & CO.

Importers and Wholesale Dealers in

Watches, Jewelry,

WATCH MATERIALS, TOOLS, GLASSES, &C.

Spectacles, Silk Guards, &c.

Wholesale Agents for American Watches.

No. 726 CHESTNUT STREET,

FIRST FLOOR,

PHILADELPHIA.

NATHAN E. MORGAN. CHAS. B. HEADLY.

MORGAN & HEADLY,

MANUFACTURERS OF

GOLD SPECTACLES,

FINE JEWELRY, CHAINS, BRACELETS,

18 Karat Plain Rings, &c.

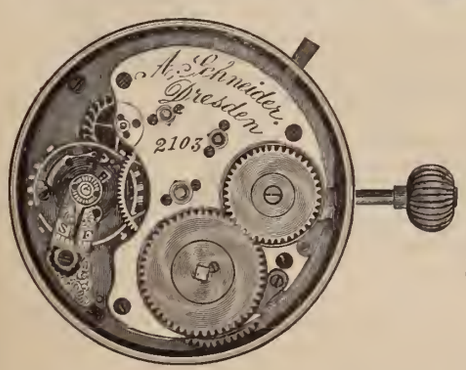
Artisan Hall, 611 & 613 Sansom Street,

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☞A full line of *DIAMONDS,* mounted and unmounted, always on hand, which we will send on approval to the Trade, on receipt of reference.

MAX FREUND & CO.

Manufacturing Jewelers.



Importers of

Watches

Jewelry and Precious Stones,

8 Maiden Lane,

NEW YORK.

☞Sole Agents for the Celebrated A. Schneider Watch, Dresden.

Notice to the Trade.

U.S. CENTENNIAL 1876 C & B TRADE MARK REGISTERED

In addition to our complete and extensive stock of watch materials of all kinds, we are also direct importers of the Henry Beguelin, Droz & Perret, and other well known watches, the most desirable goods to be found in the market. We would direct especial attention to our **"Centennial Watch,"** of which we are the sole manufacturers. We deem it proper to caution the Trade against imitations of it by unscrupulous parties who are endeavoring to palm off inferior goods advertised as "Centennial Watches." We shall take legal steps to have it stopped, and shall prosecute all infringements of our rights in the premises.

Cross & Beguelin,

No. 21 Maiden Lane, New York.



Fac-simile of the "Centennial Watch"

E. HOWARD & CO.,

MANUFACTURERS OF

Fine Watches, Regulators, Office Clocks,

Electric Watch Clocks & Tower Clocks,

Office, No. 694 BROADWAY,

Corner Fourth Street, NEW YORK.

No. 114 TREMONT STREET, BOSTON.

J. W. J. PIERSON, - - AGENT.

Dorrance, Edge & Co.

MANUFACTURERS OF

THE CELEBRATED WOVEN FABRIC

GOLD CHAIN.

Elegantly Mounted Bracelets, Opera, Leontine,

VICTORIA WATCH GUARDS & NECKLACES, in all the Newest Designs.

☞Our stock is unusually complete, and, in addition to the above, a variety of Necklaces, from 1½ to 40 dwt. each, to which we invite the attention of buyers.

No. 9 John Street, New York.

Factory, 46 Greene Street, Newark, N. J.

J. A. BROWN & CO.

OFFICE AND SALEROOM: No. 11 Maiden Lane, N. Y.

FACTORY: No. 104 Eddy St., Providence. R. I.

SOLE MANUFACTURERS OF THE

Ladd Patent Stiffened Gold Watch Cases



For the Movements of the various American Watch Co.'s, Gent's, Ladies' and Boys' sizes, Key and Stem-Winders, and in the following styles, BASCINE, FLAT-BEVEL and MANSARD, (this latter as originally named, modeled and introduced by them) forming the most complete and varied line of elegant Cases ever offered for sale. It is now eleven years since these Watch Cases were introduced to the public, during which period of time they have steadily gained in popular confidence and esteem, as is evinced by the unprecedented fact in the history of the Watch Trade that more than FIFTY THOUSAND of them have been manufactured and sold. Made of thick plates of Gold and Nickel Composition, (this Composition is harder and tougher than any other metal except the gold itself, and suggested the term STIFFENED, originally used by us to designate this important improvement; no other case in the world is made like it;) thoroughly welded together and rolled to the required thickness—they are, while equally handsome—stronger and more durable than the finest Solid Gold Cases of the same thickness of metal, and at ONE-THIRD or ONE-HALF the COST, and with good movements, they make the cheapest, most elegant and serviceable Watches in the market. The critical examination of these goods by the trade and public is invited. **FOR SALE BY JEWELERS GENERALLY.**

☞Dealers can obtain them of the Wholesale Watch and Jewelry Houses, or their Traveling Agents, throughout the United States and British Provinces.

☞All genuine Watch Cases of our manufacture, have "G. W. Ladd's Patent, June 11th, 1867," stamped upon the side band underneath the glass bezel.

Refuse all others. Send for full Descriptive Circular.

HENRY GINNEL,

Importer of Swiss Watches,

TOOLS AND MATERIALS, SILK GUARDS, &c.

And Jobber in all grades of American Watches.

No. 31 MAIDEN LANE,

P. O. Box 2967. NEW YORK.

In addition to our line of **SWISS KEY AND STEM-WINDING WATCHES, and Materials of all kinds,** we have a large stock of the celebrated **PIONEER Stem-Winding and Stem-Setting Watches** (manufactured expressly for us) and pronounced by competent workmen to be the best watch for the money in the market. They are cased in silver and German silver hunting or opened faced. **Send for Prices.**

Full Trade Discounts on American Watches.

TELL A. BEGUELIN,

(Successor to the late GINNEL & BRO.)

Importer of Watches

WATCH MATERIALS, TOOLS AND GLASSES,

No. 71 NASSAU STREET,

(UP STAIRS),

CORNER JOHN STREET **NEW YORK.**

Sole Importer of the TELL A. BEGUELIN'S BEST MAINSPRINGS.

☞Every description of Watches carefully repaired for the Trade.

MATHEZ

Watch Company,

Of NEW YORK.

Gents' and Ladies' Stem-Winding Movements

STRAIGHT LINE, 3-4 PLATE NICKEL.

These Movements are of six different grades, uniform in size and beautifully finished, and will be SOLD AT LOWER PRICES than any other goods of similar excellence.

☞A FULL LINE of materials for our movements always kept in stock for the convenience of those using our goods.

F. H. MATHEZ, Sole Agent,

No. 5 Maiden Lane, New York.

BOREL & COURVOISIER TO THE FRONT!

SWISS WATCHES

AGAIN RANK AS THE BEST.

IMPROVED MACHINERY HAS DONE THE WORK.

☞We are happy to inform our agents and patrons that the **new B & C.** are now ready. ALL ORDERS CAN BE FILLED AT ONCE! We are authorized to make a considerable reduction from former prices, in order to place them within the reach of all.

☞Dealers wishing to act as authorized agents for the sale of these celebrated Watches and Movements will be furnished with full particulars by addressing, with business card,

QUINCHE & KRUGLER,

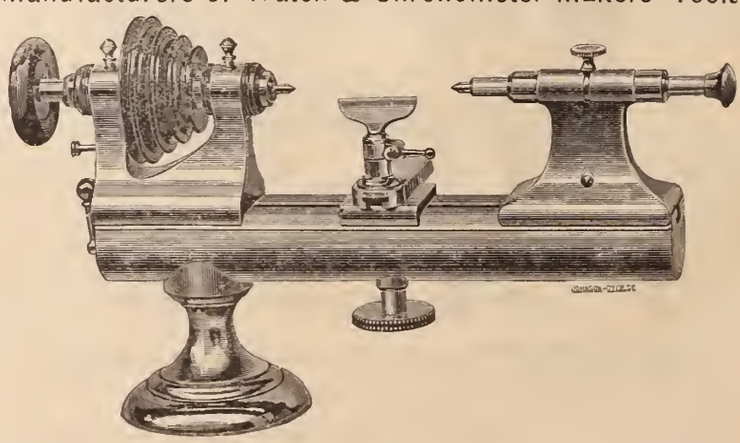
No. 17 MAIDEN LANE, NEW YORK.

Sole Agents in the United States.

American Watch Tool Co.

Formerly J. E. WHITCOMB & Co.

Manufacturers of Watch & Chronometer Makers' Tools.



P. O. Box 999. WALTHAM, MASS

ESTABLISHED 1845.

A. SALTZMAN,

(LATE A. SALTZMAN & CO.,)

MANUFACTURER AND IMPORTER OF

Fine Swiss Watches

SOLE IMPORTER OF THE

AUGUSTE SALTZMAN
VICTOR VUILLAUME
ALBERT VUILLE
} Watches



SPECIAL NOTICE.

The Trade is respectfully notified to beware of imitations of the name of Saltzman, marked on Watches of an inferior grade, and purporting to be the genuine Saltzman.

No. 15 Maiden Lane, New York.

GAS FIXTURES.

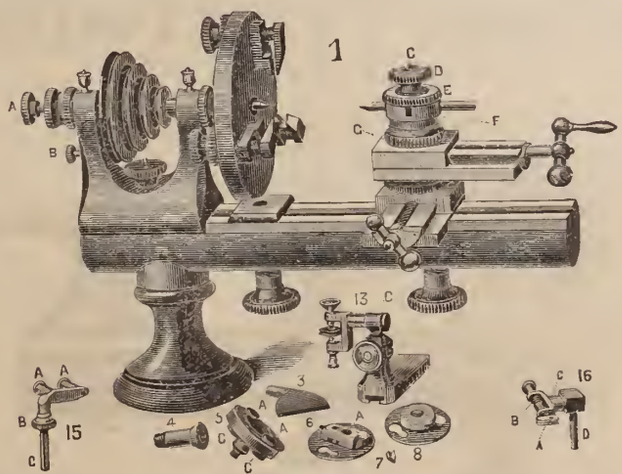
ARCHER & PANCOAST M'F'G CO.,

No. 67 Greene Street,

Nos. 68, 70 and 72 Wooster Street,

NEW YORK.

HOPKINS' WATCH TOOL CO



Manufacturers of HOPKINS' PATENT WATCHMAKERS' TOOLS, embracing Plain and Combination Lathes, Chucks, Slide and Swing Rests, Gear Cutters, Pivot Polishers, Jeweling and Staking Tools, &c.
Illustrated circulars sent on application.
HOPKINS' WATCH TOOL CO., Waltham, Mass.

KOCH SONS & CO.,

MANUFACTURERS OF

Adjustable Leaves for Photograph Mounts

☞Specially adapted for showing Photograph Examples of Wares, arranged to bind in connection with our patent binder.



Every leaf is so arranged that it can be inserted or detached without disturbing the rest. ☞ Binders adjusted to the JEWELERS' CIRCULAR, capable of holding one year's edition

Full cloth, and embossed in gilt,..... $1.25
Leather back and corners, cloth sides..... 1.50

No. 156 William Street, New York.

WM. J. SUTTIE,

MANUFACTURER OF

Spectacles & Eye Glasses



In Gold, Silver, Steel and Shell

Jobber in Spectacles & Eye Glasses,

Cylindrical, Prismatic & Combination Glasses a specialty.

REPAIRING FOR THE TRADE.

No. 39 Maiden Lane, New York.



REMOVED TO No. 658 BROADWAY.

MANUFACTURERS OF EXCLUSIVELY

BLACK ONYX GOODS,

WOGLOM & MILLER,

32 & 34 JOHN STREET,

NEW YORK.

H. Muhr's Sons, Philadelphia.

MANUFACTURING JEWELERS,

Solid Gold Finger Rings of Every Description.



Crown, 18k. Lion.



On and after January 'st, 1876, our make of Filled Plain Rings will be stamped as above, which stamp is copy righted. Any and every infringement on the above Trade Mark will be dealt with according to law. ☞Every one warranted.

THESE GOODS ARE SOLD BY ALL THE LEADING JOBBERS!

Should the house that any retailer deals with not have them we will furnish them with the address of the nearest Jobber. ☞SELL TO THE JOBBING TRADE ONLY!

New York Office, 11 Maiden Lane.

☞ Address all communications to Philadelphia.

Wm. C. Greene & Co

GOLDSMITHS

MANUFACTURERS of RICH SETS IN TAPER WIRE CORAL

Stone Cameo, Amethyst, Coral Cameo, Engraved, Enamel Sets, Brooches, Sleeve Button, Studs Closets, EAR Drops &c.

Factory 95 PINE ST. Providence, R. I.

NEW YORK OFFICE, No. 192 BROADWAY.

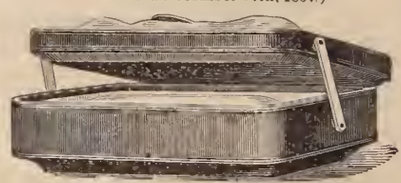
WM. C. GREENE B. W. GREENE. GEO. D. BRIGGS.

ESTABLISHED 1854. ☞Medal and Diploma Awarded at Centennial Exhibition.

JUDGES' REPORT:—Well made and good patterns—Double Hinge as a useful improvement

(Patented December 17th, 1867.)





G. F. KOLB & SON,

MANUFACTURERS OF FINE

Morocco, Velvet and Cabinet Cases,

FOR JEWELRY, WATCHES & SILVERWARE.

TRAYS FOR SHOW CASES, TRUNKS, &C.

732 Sansom Street, PHILADELPHIA.

BOOZ & THOMAS,

MANUFACTURERS OF

Watch Cases & Jewelry,

108 SOUTH EIGHTH STREET,

Second Story, PHILADELPHIA.

Illustrated Catalogues sent upon application.

Old Gold & Silver Bought or Exchanged.

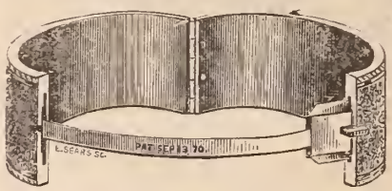
PARTICULAR ATTENTION PAID TO REPAIRING.

Established 1845.

WM. H. BALL,

SUCCESSOR TO

BALL & BARNARD,



Manufacturing Jeweler,

Fine Gold, Enameled and Colored

BRACELETS,

A SPECIALTY!

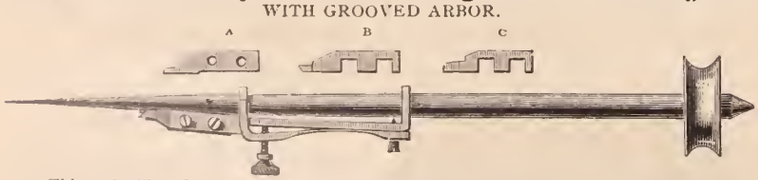
☞ All my Bracelets have the PATENT GUARD at no additional expense, Thus saving the price of chains.

No. 9 JOHN STREET, NEW YORK.

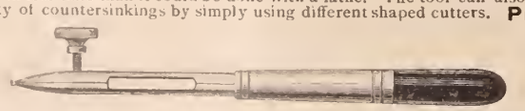
Factory, 30 Franklin Street, Newark, N. J.

Schwerter's Patent Adjustable Jewel Setting and Counter Sinking Drill.

WITH GROOVED ARBOR.



This tool will enable any watchmaker of ordinary skill to do a good jeweling job, and in some cases in less time than it could be done with a lathe. The tool can also be used to make a variety of countersinkings by simply using different shaped cutters. **Price $5.**



This Cut represents **Schwerter's Patent Jewel Setting Opener,** a very handy tool, which will in almost every instance open a closed jewel bezel without injuring it. **rice $1.25.**

On receipt of Price these tools will be promptly forwarded to any address.

Address Aug. Schwerter, 51 Canal St.. N. Y.

☞ A liberal discount will be made to dealers on orders of not less than ¼ Dozen.

GEO. B. WHEELER,

NEW BEDFORD, MASS.

MANUFACTURER OF FINE

Watch and Clock Oil.



THE PORPOISE.

☞This Oil is made from the best of stock, is free from gum or corrosion, will stand the coldest weather, and is every way reliable.

L. HAMMEL & CO., Sole Agents,

No. 9 Maiden Lane, New York.

KOCH & CO., Elberfield, Prussia, SOLE AGENTS IN EUROPE.

Dealers in Watches,

Importers of Diamonds.

OPPENHEIMER, BROS. & VEITH,

Manufacturing Jewelers,

35 MAIDEN LANE,

S. Oppenheimer, A. Oppenheimer, New York. Henry F. Veith. Gus. F. Veith,

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I. PFORZHEIMER. D. KELLER.

PFORZHEIMER & KELLER,

IMPORTERS OF

Watches and Diamonds

Dealers in American Watches,

AND

Manufacturers of Jewelry,

No. 24 JOHN STREET,

P. O. Box 4144. NEW YORK.

T. B. BYNNER,

IMPORTER AND JOBBER OF

WATCHES,

DIAMONDS AND FINE JEWELRY,

AND DEALER IN THE

BEST CLASS OF ROLLED PLATE JEWELRY

—AND—

Key and Stem-Winding American Watches,

No, 513 BROADWAY, NEW YORK.

CRYSTAL CHANDELIERS,

Gilt, Bronze and Decorated Gas Fixtures,

FINE MARBLE AND BRONZE CLOCKS

Bronze Figures and Ornaments in Greatest Variety. at Low Prices,

MANUFACTURED BY

Mitchell, Vance & Co.,

Nos. 836 & 838 Broadway, New York.

"Medal of Special Award," by American Institute, 1872.

No. 719, GAS FIXTURES.

MITCHELL, VANCE & Co., 597 Broadway, N. Y.:

"We find the above-mentioned Fixtures and Glass Chandeliers, for design excellence of workmanship and finish in all their parts, to be the best production in the country and we may say, in our judgment, excelled by no other country in WORLD.

"We recommend a MEDAL OF SPECIAL AWARD for CHANDELIERS and GAS FIXTURES. (Signed) JOHN W. CHAMBERS, Secretary.

Medal of Special Award confirmed.

Goldsmith & Schliesser,

Manufacturing Jewelers,

—AND—

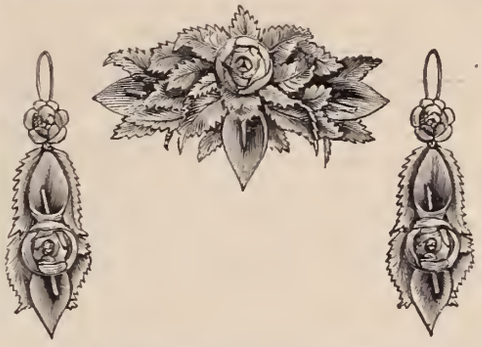
Importers of Diamonds & Watches,

No. 5 Maiden Lane,

Factory, 56 West 4th Street, **NEW YORK.**

Celluloid Novelty Comp'y,

W. S. SILLCOCKS, President. F. R. LEFFERTS, Sec'y and Treas.



MANUFACTURERS OF

IMITATION

Coral Jewelry.

4 Maiden Lane, New York.

☞Our goods are sold by all the leading jobbers in the country.

E. A. HALDIMAN,

IMPORTER OF

Watches, Watch Materials,

AND OPTICAL GOODS;

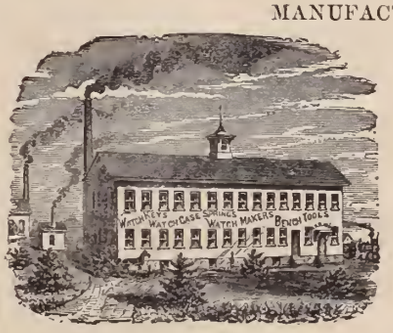
Also DEALER IN JEWELRY,

No. 66 Nassau Street, New York.

☞I am preparing for the convenience of country dealers a price list of the above goods. PRICES GREATLY REDUCED.

A. N. Clark, Plainville, Ct.

MANUFACTURER OF



WATCH KEYS,

WATCH CASE SPRINGS,

Watchmakers' & Jewelers'

BENCH TOOLS.

Crosby's Jeweling Tools, &c.

Sold by Jobbers in Watch Materials and Notions.

☞**Small Articles in Metal Manufactured to order.**

WATCHMAKING IN AMERICA.

A FOREIGNER'S TESTIMONY.

SPEECH DELIVERED IN THE AMPHITHEATRE OF THE PRIMARY COLLEGE OF LA CHAUX-DE-FOND, TUESDAY, THE 14th OF NOVEMBER. BY M. EDOUARD FAVRE-PERRET, MEMBER OF THE INTERNATIONAL JURY ON WATCHES OF THE EXHIBITION AT PHILADELPHIA, AND ONE OF THE SWISS COMMISSIONERS TO THE UNITED STATES.

Mr. Arnold Grosjean, President of the Board of Commerce, announced that M. Edouard Favre-Perret, member of the International Jury on Watches of the Exhibition, at Philadelphia, had kindly consented to repeat at la Chaux-de-Fond, the speech already delivered by him at Locle and Neuchatel, on the situation of the Industry of Watchmaking in the United States.

The Board of Commerce would have liked to be able to present the public some specimens of American watchmaking, but this was not possible. In a few days from now a selection of twelve American watches will be placed in the Horological School, where exerybody may examine them.

Mr. Grosjean then added that after the lecture the orator would kindly answer any question that might be put him.

THE ADDRESS.

GENTLEMEN: I must, to start with, announce to you that you have not an orator before you, but a manufacturer, and as such I ask your indulgence. I shall give you information, which, unluckily is not cheerful, on the condition of Swiss watchmaking compared with the American competition. I shall tell you of facts simply, such as I have seen them, such as I have understood them. Frankness is here more necessary than anything else, for it is not by palliating the bad sides of a difficult situation that we can succeed in improving it.

It is evident, gentlemen, that I do not present you with an entire report of my observations at the Exhibition at Philadelphia; these will find space in my report which I shall address to the Federal Council. I shall confine myself to speaking about American watchmaking, and in comparing it with our own and that of our neighbors. I shall speak to you more about figures that anything else. Figures, you know, have their own eloquence. For a long time we have heard here of an American competition without believing it. The skeptics—and there were many of them—denied the possibility of a competition at once so rapid and so important. To-day we are forced to believe the proofs of it, and to acknowledge the existence of a formidable manufacture. We have had the proofs of it under our own eyes; we have seen the American factories, and we have been able to satisfy ourselves exactly as to their power. We have treated the American manufacture as we have treated the neighboring manufactures, in the future of which we did not wish to believe at first, and which form to-day a most serious competition. I refer to Besancon, Bienne, St. Imier, Morat and Schauffhausen. We must take these examples into consideration and spare no efforts to keep and maintain ourselves on the level of our competitors, and we must not allow ourselves to be overtaken by them, as has been the case in past years. Before passing to the watchmaking of the United States, let us examine some of the figures of the manufacture of Besancon, which everybody knows date back to the end of the last century. It was founded by a colony of Neuchatels.

I 1845	Besancon t		rned out.....	54,000	watches.
In 1855	"	"	"	192,000	"
In 1865	"	"	"	296,000	"
In 1875	"	"	"	420,000	"

To-day Besancon supplies the great market of France, and she prepares to contest with us the other European markets.

Well, gentlemen, we are on the same road as regards the United States. For a long time America has been the principal market for our watches, our milk-cow, so to speak. To-day we must earnestly prepare to struggle with the Americans on the fields where hitherto we have been the masters. Some of you have known Mr. Dennison, who was, we may say, the father of American watchmaking. Mr. Dennison traveled through the Canton of Neuchatel, studying our mode of manufacturing, seeking to inform himself of everything, and carefully noting the weak parts in our industry. After his return to the United States he founded a factory at Boston, "The Boston Watch Company. This was in 1854. The capital—scarcely $100,000—was subscribed by capitalists more than by practical business men. In the beginning the company turned out only the rough skeleton movement, and attended to the finishing; all other parts, such as trains, balances, jewels, etc., etc., were imported from Switzerland. Little by little, however, this factory extended its operations, and produced other parts. Notwithstanding all this progress, this mode of doing things not suiting the American character, so little inclined to let capital remain almost unproductive, the capitalists abandoned the factory, and it failed in 1856.

Another American, Mr. Robbins, whom you have also known, gentlemen, when he had business relations with us, scented a good speculation, and bought in the entire factory, tools included, for $75,000. A new company, "The American Watch Company," was afterward formed, with a capital of $200,000. Soon this capital became insufficient, and it was increased to $300,000 before the War of Secession. This war, which seemed calculated to destroy such an enterprise, was, on the contrary, the cause of its prosperity. America put on foot a million of soldiers, and as every one wanted his watch, there was great animation in the watch business. At this juncture, which might have been a lucky one for our industry, we failed to comprehend our real interests. Instead of sending good watches to the Americans the worst trash was sent. Had mere skeleton movements been sent in cases they would have been thought good enough. The Americans, however, went to work on an entirely different plan. The company increased their plant, and turned out a better ordinary watch than the Swiss watch. At the end of several years, and with the aid of patriotism, the American watch enjoyed a good reputation, while our own was discredited everywhere. In 1865 the capital was increased to $750,000, and the operations of the new company grew to immense proportions. During the following years business went on so well that everywhere new watch factories sprung up. Every one wanted to make watches. To-day you can count about eleven factories. The most important, after the Waltham Company, is the one at Elgin, which turns out about 300 movements a day. The Waltham Company gives 900 workmen employment, and makes about 425 movements per day. The company again increased their capital in 1872; it amounts to-day to $1,500,000, besides $300,000 as reserve fund, or a capital of 9,000,000 francs. This watch factory is a real power; there is none like it in Europe. We have seen it in all its details, and we have admired its splendid organization. Last May, on the eve of the Exhibition, we still seemed masters of the situation. One event, however, dealt us a mortal blow. Be it through the effect of the crisis, or from any other motive, the Elgin Company made, all of a sudden, a reduction on the price of their movements of 40 per cent. to 50 per cent., so that all stocks of Swiss watches were seriously affected. Lever movements, with visible pallets, were sold at 19 francs. How can we meet this? Under such circumstances how can we maintain competition? It will be necessary to turn out our movements at 13 or 14 francs to pay the custom duties and leave a little margin of profit. The Waltham Company, however, would not be outdone by the Elgin Company; they even proposed to do better. They announced a reduction of price from 40 to 50 per cent. on prices already lower than their rivals, but at the same time they made known that this reduction would go back as far as Jan. 1, 1876. So that a dealer in watches had simply to indicate the stock of his Waltham goods on hand to secure the rebate of 40 or 50 per cent. This *coup de commerce* has cost the Company $40,000.

It is unnecessary, gentlemen, to tell you how very detrimental this was to the Swiss watch. Still another and more important reason explains the growing prosperity of the American Company Their tools work so regularly, that all parts of the watch may be interchanged by a simple order on a postal card, without necessitating the forwarding of the adjoining piece. The question has often been asked, whether the Americans can supply the demands of their markets? Yes, they can; we are driven out of the American market! I herein exclude, however, complicated watches, in which we are now, and I hope shall always remain masters.

In 1860 the American Compahy produced only 15,000 watches; in 1863, 100,000. To-day they produce 250,000, and this figure can be easily doubled in case the crisis, which so severely prevails there as well as here, should come to an end. For we must not forget that if several factories have been closed during the crisis, the tools as well as the workmen are there, all ready to resume work again. Nor must we leave out of sight the exorbitant custom duties and freight, which amount to about 25 or 30 per cent., which take away from us every possibility of being able to stand the fight. And now that we know the figures of production in the United States, we can easily, with the aid of official reports, give an account of what is that country's consumption of watches. We have sent to the United States:

In 1864	169,000	watches.
In 1865	226,000	"
In 1866	262,000	"
In 1867	207,000	"
In 1868	209,000	"
In 1869	206,000	"
In 1870	330,000	"
In 1871	342,000	"
In 1872	366,000	"
In 1873	204,000	"
In 1874	187,000	"
In 1875	134,000	"

In 1876, we shall barely send there 75,000 watches, or, since 1872, a deficit of 300,000 watches. What a loss for Switzerland, and particularly for Neuchatel! For this deficit concerns principally our Canton, and it is very easy to convince oneself of the fact. In 1875, Chaux-de-Fonds turned out 106,000 watches or movements. In preceding years she turned out double that amount. The deficit therefore amounts, for la Chaux-de-Fonds alone, to 4,000,000 francs; for Locle, Neuchatel, etc., it reaches the same figure in proportion.

We have stated that the shipment of our goods has largely decreased. Shall we attribute its cause to the crisis? Certainly in many respects we may do so; it cannot be denied. But the American competition contributes still more largely to it.

The Americans have already commenced to send their manufacture to Europe. In England they sell annually from 20,000 to 30,000 watches. The American watch commences to drive from the English market the Swiss and even the English watch. The Americans commenced by creating a demand for their goods in the Indies and in Australia; and then—thanks to some powerful exporting houses—they invaded England. At Moscow and St. Petersburg they have already established important branch offices. They do not keep it secret, but loudly advertise it; their aim is to drive us first out of their country, and then to compete with us on our own soil, if our sluggishness and our blind confidence leave the field free to them. I sincerely confess that I personally have doubted that competition. But now I have seen—I have felt it—and I am terrified by the danger to which our industry is exposed. Besides, I am not the only one to think so; the "Société Intercantonale" has sent a delegate to make inquiries, and his report perfectly agrees with mine. Up to this very day, we have believed America to be dependent upon Europe. We have been mistaken. The Americans will send us their products since we cannot send them our own. Their importation is not confined to watches alone. Other European trades are threatened like ours. Already America has commenced to send cotton goods to England, which hitherto monopolized that article in all the markets of the world. In 1840, the American Government compiled the statistics of the products of their manufactures. They amounted to $198,000,000; in 1850 to 1 milliard; in 1860 to $1,885,000,000, and in 1870 to $4,200,000,000. Not all of these products are being sold in the interior of the United States; a good share of them are exported. Nevertheless, from June 30, 1874, to June 30, 1875, the imports were larger than the exports. We ask ourselves, whether the Americans can maintain their prices? I answer, yes they can, for if they obtain a good profit on their superior quality goods, they can afford to be satisfied with a smaller profit on the lower grades of watches. In America everything is made by machinery; here we make everything by hand. We count in Switzerland about 40,000 workmen, making on an average each per annum 40 watches. In the United States the average is 150 watches. Therefore, the machine produces three and a half to four times more than the workman. It remains for us to solve the situation. But how can we get out of the corner into which we have been driven? To-day, even without machines, we cannot dispose of the 1,600,000 watches which our people can manufacture. How will it be if we establish machines which will thrice increase our production? We must either diminish the number of our hands and make machines, or else cling to our system and be resigned to see our industry decline.

Gentlemen, I do not pretend to point out the remedy. I simply call your attention to the evil—that is all. It remains for you to find the cure. However, I believe that it will be good to do for our mechanicians what we have done for our watchmakers; that is, to create schools. You must not despair; you must not desert the field; we must, on the contrary, organize for resistance and to reconquer the lost ground. If America closes her gates to us by custom duties and exorbitant freights, we are at least left the resource of energetically fighting against her in European markets.

[Here the orator gave an extract from the report of Mr. Hirsch, (Director of the Observatory) to the Council of State, after the Exhibition of 1867. This report already signaled the danger confronting our industry. Resuming he said:]

Had the Philadelphia Exhibition taken place five years later, we should have been totally annihilated without knowing whence or how we received the terrible blow. We have believed ourselves masters of the situation, when we really have been on a volcano. And to-day we must actually struggle if we do not want to encounter in all the markets that rival manufacture. Did we not sneer at Besancon at the outset? And now Besancon suffices for France, and besides, she exports her surplus of manufacture. We ask ourselves if, in reducing the prices of watches, we can increase their sale in the same proportion? And if the sales do not increase, what will become of us? We shall have an enormous stock of goods and a permanent stagnation. The custom duties, you know, amount to 25 per cent. For a long time hopes have been entertained that they might be reduced. We cannot count on it. America needs all her resources, especially in the present situation, and, whether Democrats or Republicans be in power, we cannot hope for a reduction in the import duties. We must therefore make up our minds to lose the American market.

It has been said, and it has been complacently repeated, that the Americans do not make the entire watch, and that they are dependent upon Switzerland for several parts of the watch. This is a mistake. The Waltham Company makes the entire watch—from the first screw to the case and dial. It would even be difficult for them to use our products, so great is the regularity, so minute the precision with which their machines work. They arrive at the regulation of the watch—so to say—without having seen it. When the watch is given to the adjuster, the foreman delivers to him the corresponding hairspring, and the watch is regulated. [Sensation among the audience.] Here is what I have see gentlemen! I asked from the director of the Waltham Company a watch of the fifth grade. A large safe was opened before me; at random I took a watch out of it and fastened it to my chain. The director having asked me to let him have the watch for two or three days, so as to observe its motion, I answered, "On the contrary, I persist in wearing it just as it is, to obtain an exact idea of your manufacture." At Paris I set my watch by a regulator on the Boulevard, and on the sixth day I observed that it had varied 32 seconds. And this watch is of the fifth American grade; it costs 75 francs (movement without case). At my arrival at Locle I showed the watch to one of our first adjusters, who asked permission "to take it down"—in other words, to take it to pieces. I, however, wished first to observe it, and here is the result, which I noted: Hanging, daily variation 1½ seconds; variation in different positions, from 4 to 8 seconds; in the "heated room" the variation was but very slight. Having thus observed it, I handed the watch to the adjuster, who took it down. After the lapse of a few days, he came to me and said, word for word: "I am completely overwhelmed; the result is incredible; one would not find such a watch among fifty thousand of our manufacture."

This watch, gentlemen, I repeat to you, I took at hazard—out of a heap, as we say. You understand from this example that the American watch may be preferred to the Swiss. I have finished, gentlemen, and I have told you of things such as I have seen them. It remains for us to profit from this sad experience, and to improve our manufacture. Competent men are not wanting among us; they must go to work at once.

A round of applause followed the speaker as he descended the tribune.

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Velvet Cases for Diamonds a Specialty.

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In placing these Oils before the Trade, we do so with entire confidence, from many years' experience in procuring them from the fish, and in their preparation for use, and more than all, the thorough and SEVERE TESTS they have been subjected to in use upon Chronometers in our whale ships, often absent from fifty or sixty months. ☞Liberal samples furnished on application.

ROSKOPF WATCH.

J. D. HUGUENIN & CO.,

GENERAL AGENTS,

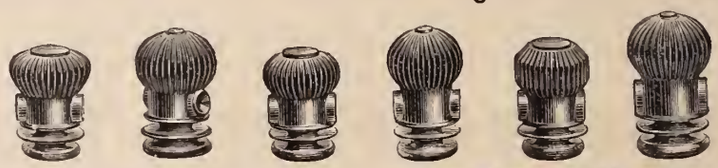
No. 12 Maiden Lane, New York.

The reputation of this Watch as an accurate timekeeper is fully established, and during the ten years that it has been before the Trade, has won an abiding reputation for fine Time-keeping qualities, and the BEST WATCH for the money in the world.

☞Send business card for price list.

MILNE & JOURDAIN,

Manufacturers of Stem-Winding Watch Crowns



13 & 15 Franklin Street. NEWARK, N. J.

Gold Crowns, for Stem-winding Movements, to suit all sizes of Imported or American Watches, in four different styles and seven sizes.

Gold Pushers for Key Movements in every size. Also Gold Crowns for fine Chronograph Watches made to order.

☞Silver Stem winding Crowns and Key Pushers on hand or made to order. Send for card and samples.

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D. LIECHTY, B. LEVY.

D. LIECHTY & CO.

MANUFACTURERS OF

Gold and Silver Watch Cases,

—AND—

DEALERS IN AMERICAN WATCHES,

No. 402 Library Street,

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Lubricating Oils, for Watch, Clock and Chronometer Makers.

The discovery of a Lubricator for FINE MACHINERY, such as Watches, Clocks and Chronometers, that is free from gum and corrosive substances, has taxed the ingenuity of hundreds of men whose efforts have proved a failure. But we are happy to say (being largely interested) that such an article has been supplied by MR. EZRA KELLEY, of New Bedford Mass., who, after forty years study of the subject, has perfected a Lubricator that recomends itself to all who have used the *genuine*, (there having been numerous counterfeits in the market,) as witness also the award of a Diploma and Medal by the judges of the late Centennial Exhibition at Philadelphia. We have no hesitation in saying that his Oils are the BEST manufactured, always uniform in quality and capable of standing all tests applied to lubricating oils. We cheerfully recommend it to all who may in their business require a FIRST-CLASS LUBRICATOR







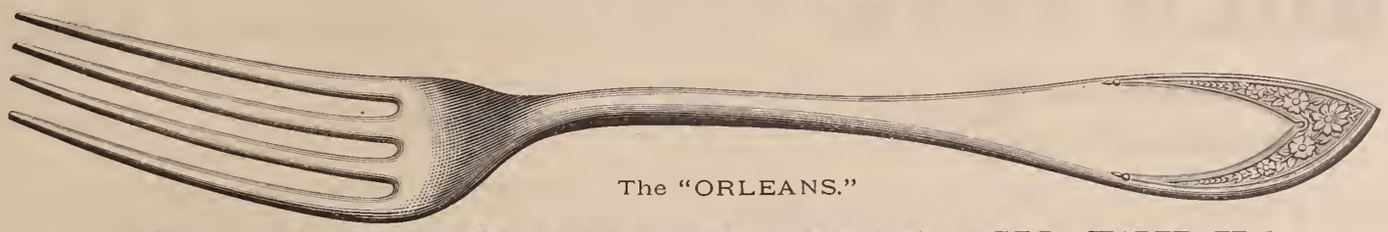
AMERICAN CLOCK CO., (Hine & Thomas.)

P. S.—The above Oils can be procured at all first-class wholesale Watch and Clock Establishments in the United States, as well as his only Agents, GRIMSHAW & BAXTER, 35 Goswell Street, London England.

New Bedford, October 15, 1877.

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Manufacturers of the Finest Electro-Plated Ware.



The "ORLEANS."

UNSURPASSED IN QUALITY, STYLE AND FINISH!

Factories, Wallingford, Conn. Salesroom, 75 Chambers St., New York.

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Spoons, Forks, Ladles, Fancy Pieces,

Solid Handle Steel Knives, &c., of the finest quality.

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Works at Waterbury, Conn.

L. & A. MATHEY,

IMPORTERS OF FINE WATCHES AND MOVEMENTS



Removed Feb 1st, to 16 Maiden Lane.

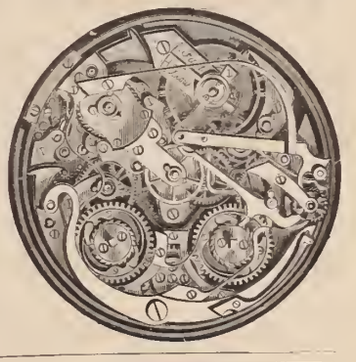
Independent ½ Seconds, Minute Repeaters, Minute Chronographs, Plain Chronographs, Double Chronographs, Independent Split Seconds, Perpetual Calendars, Pocket Chronometers.

MINUTE CHRONOGRAPHS, WITH MINUTE REPEATER.
CHRONOGRAPHS, WITH MINUTE REPEATER.
AND A FULL LINE OF MEDIUM GRADE WATCHES AND MOVEMENTS.

Sole Agents for the H. L. MATILE WATCHES.

☞Timing and Complicated Watches a specialty. All our Watches are tried and tested before delivery. ☞Goods sent for examination on satisfactory references.

"TIME AND TIME-KEEPERS," an interestng essay on the rise and progress of Watch-making, sent free to any address on applicaion.





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No. 20 JOHN STREET. NEW YORK.

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Watch and Chronometer Makers.

WATCHES OF OUR OWN MAKE.

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☞ Medals and Diplomas at the International Exhibitions in London '62, Paris '76, Vienna '72, Philadelphia '76.

REMOVED

From No. 3 to

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☞ *"Medal and Diploma awarded at Centennial Exposition for superior mechanical execution and artistic ornamentation."*



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Manufacturers of Watch Cases.

DEALERS IN AMERICAN WATCHES AND IMPORTERS OF FINE KEY AND STEM-WINDING MOVEMENTS,

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A full stock of Key and Stem-Winding Gold Cases always on hand. Goods sent on approval when satisfactory references are furnished.

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EVERY DESCRIPTION OF
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MASONIC MARKS,
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FINE WHOLE PEARL JEWELRY.

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Manufacture CHEMICALLY PURE COPPER for ALLOYING, and are prepared to fill orders for same, either in the Wire, Strip or Granulated form. Its PURITY has been attested as follows.

UNITED STATES ASSAY OFFICE, 30 WALL STREET,
NEW YORK, Dec. 21st, 1877.

BROWN & BROS.

Dear Sir.—We have analyzed the two samples of Copper left with us on the 18th instant, one said to be foreign refined Copper as used by jewelers, the other a refined Copper as manufactured by you for the same purpose. We find both samples alike in purity, and no difference can be detected by a careful chemical analysis, both being samples of PURE METALLIC COPPER, having no traces of antimony, tin, arsenic, zinc or lead.

TORREY & EATON.

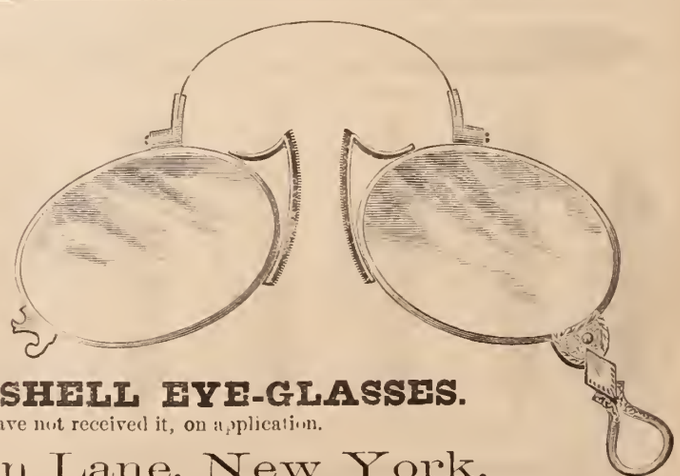
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☞ Will send our Catalogue, fully illustrating all goods, to those who have not received it, on application.

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NOVELTIES IN BANGLE RINGS: "Mizpah," "Roma," "Salve," "Bonheur," &c.

New designs in CAMEO, ONYX AND AMETHYST RINGS. *Estimates furnished for* CLASS RINGS, BADGES, &C.

Orders solicited for goods on approval. Stone Seal Engraving and Jobbing of every description promptly and carefully done at lowest prices.

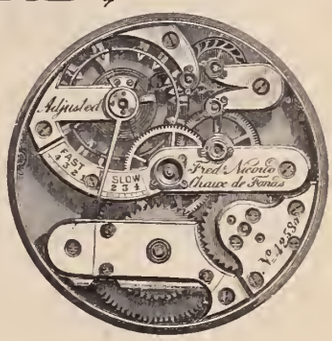
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Importers of Fine Swiss Watches,

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TRADE MARK.
NICOUD WATCH
No. 16



Factory, 12 Rue St. Pierre, Chaux de Fonds, (Suisse.) Established 1847.

Sole Importers of the { Frederic Nicoud / Fred Nicoud & Son / Arnold Nicoud / Louis Nicoud } WATCHES.

☞ *All Watches fully Warranted as to quality of Movements and Cases.*

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Finest Quality of Electro-Plated Flat Table Ware.

PATENTED HEAVY SPRING TEMPERED SHANK ON FORKS AND SPOONS.

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Self-Adjusting Watch Keys.

WILL WIND ANY WATCH.

FOR SALE BY THE TRADE GENERALLY.



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J. EUGENE ROBERT, Importer of Watches,

No. 30 MAIDEN LANE, NEW YORK.

Sole Agents for Longines Watch Co., "Agassiz" Ladies' Stem-Winders,
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Stem-Winding and Setting Movements,

IN NICKEL AND IN SILVER CASES.

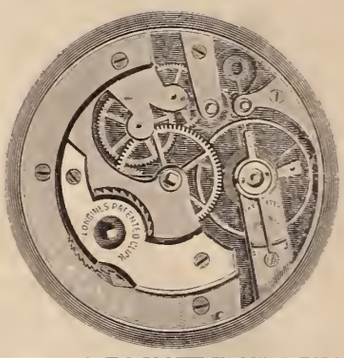
GENTS' AND BOYS' SIZES.

Unsurpassed for durability, PRICE and Timekeeping qualities.
Manufactured on the system of uniformity of sizes
and interchangeability of parts.

FINISHED MATERIALS ON HAND.

Paris, 1867. Vienna, 1873 Philadelphia, 1876.

☞Fac-similie of the LONGINES STEM-WINDER, so popular in the Trade.



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Respectfully announces to the Trade that he still continues the business of *ELECTRO-PLATING* in Gold, Silver and Nickel. His improved process of Electro-plating enables him to deposit a greater thickness of gold, etc., on the article to be plated than by the old process. In proof thereof he refers to any of the large jewelry jobbing houses in this city.

☞Orders promptly attended to, and prices at lowest rates.

ESTABLISHED 1868

OFFICE OF

C. G. ALFORD & CO.

MANUFACTURING JEWELERS,

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New York, July, 1878.

Apply for our ILLUSTRATED CATALOGUE, enclosing your business card. Price List separate from Catalogue. Parties not in the jewelry trade cannot get it under any circumstances.

C. G. ALFORD & CO.

TIFFANY & Co.

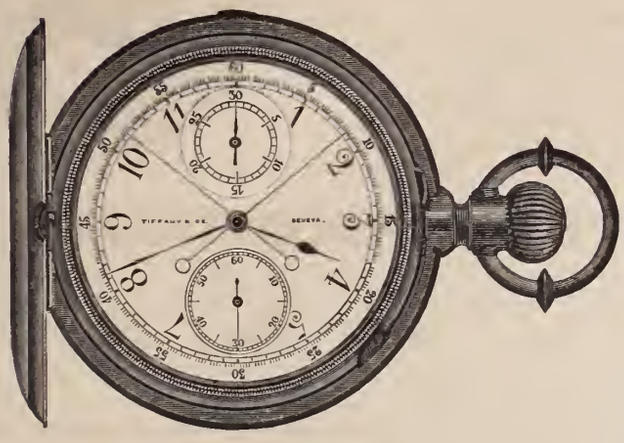
NEW YORK, PARIS, LONDON, GENEVA.

MAKERS OF

FINE AND COMPLICATED WATCHES

Wholesale Office, 14 John Street, New York.

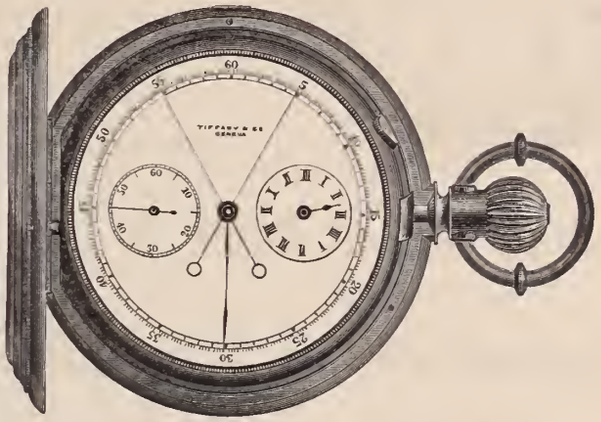
GEO. R. COLLIS, Manager.



Independent Minute and Second Chronograph.

SINGLE AND SPLIT SECONDS.

THE above cut represents our new Watch, which we take pleasure in introducing to the Trade as the most complete, accurate and reliable for sporting and scientific requirements. At each revolution of the chronograph *second* hand, the small hand in the upper sunk dial records *one minute*, and when at the finish of the observation or race, the *exact* time is wanted, the number of minutes are found to be recorded as well as the fifth part of a second. To time the ¼, ½ or ¾, press the push at figure 60, when one of the split second hands will stop; after obtaining the time, press the same push again, when the hand will fly forward to the other split second hand and continue its course with it as before. By pressing in the push at the stem, the minute hand on sunk dial and the chronograph second hands *fly back* to their original positions.



Split Second Chronograph.

THE above cut represents one of our celebrated Split Second Chronographs, reliable timing watches for sporting and scientific requirements. These watches are constructed upon the latest approved scientific principles, and their mechanism is such that the time can be recorded to one-fifth of a second, and the split-second part is so beautifully constructed that by pressing a push at figure 60 on the dial, the quarter, half and three-quarter mile or observation is recorded by one of the hands without interfering with the record of the full observation. By pressing in the push at the stem, the chronograph hands will *fly back* to their original positions. These Chronographs are also made by us in connection with Minute, Five-Minute and Quarter-Hour Repeaters.

THE STANDARD TIFFANY WATCHES are constructed upon the most approved scientific principles, combining simplicity, strength, durability and time-keeping qualities.

The simplicity of construction renders them less liable to get out of order than more complicated Watches, and reduces the cost to the minimum at which Watches of the same grade can be produced. Each Watch is adjusted to temperature and position, stamped with the name of the house, and fully guaranteed.

ALL Watches of our make have the firm name "TIFFANY & Co." engraved upon the movements, and the trade are cautioned against apparent fac-similies put upon the market by certain *unscrupulous* dealers. The TIFFANY Watches are cased in 18 KARAT GOLD, have an established *retail* price, and we *positively* refuse further supplies to anyone underselling them.

☞ *Goods sent for selection or examination on receipt of satisfactory references. Orders for engraving, ornamenting or refinishing nickel movements, and engraving inscriptions, devices, and monograms on cases promptly attended to.*

☞ *Also General Agents for Messrs.* PATEK, PHILIPPE & Co., *Geneva, Switzerland, a full line of whose watches will be found at our office.*

What a Practical and Scientific American Watchmaker says about Swiss and American Watches.

GENEVA, March 26, 1877.

MR. EDOUARD FAVRE-PERRET, Locle, Switzerland.

Dear Sir:—Having been informed that you are sufficiently familiar with the English language, I need not offer any apology for addressing you in it.

The object of this letter is to ask a few questions, and perhaps make a few comments, upon the speech delivered by you at Locle, Chaux-de-Fonds, and in this city, a short time since. Papers containing the speech in English have been sent to me from many parts of the United States as well as from England, with the questions, "What does all this mean? Can it be possible that Mr. Favre-Perret has said th se things? Was E. F. P. paid for this speech by the American Watch Company?" etc. These questions are but specimens of what is asked by those among my friends who are not connected with our profession, and only know of, or about, the Swiss watch industry what I may have happened to tell them in a casual way. At first, I thought best not to waste my time, nor trouble myself, about the matter, but I find the American Watch Companies are expending a fortune in displaying your words to the American public through the medium of newspapers and otherwise, and thus, in the most unjust manner, reflecting discredit and bringing ruin upon an industry of which Switzerland, above all other countries, has a right to feel proud.

I send you by this mail a copy of an American journal containing your speech, for the publication of which the American Watch Company paid (I am told) nearly two thousand francs for the single insertion.

I am an American, and have been connected with the watch busi ness in my own country for the past twenty-five years, and I trust you will not deem it a boast on my part if I state that I am acquainted with American Watch manufacture in all its details. It is well-known to my acquaintances, both in and out of the trade, that I came to Switzerland to manufacture a watch which I claim *cannot* be made in the United States, for want of proper facilities and the indispensable skilled labor. Therefore, you can well see why your speech above referred to should be questioned by others, as well as myself. Many statements in it are so far at variance with what my experience has taught me, both in America and this country, that I am at loss to understand whether you intended that your remarks should be taken as the language would seem to imply.

You say, "In America, everything is done by machinery; here in Switzerland, everything is done by hand." Question:—How can this statement be reconciled in the face of the fact that Switzerland is overflowing in her abundance of watch-machinery?

In Geneva, we find factories with long lines of machinery of the choicest kinds, some running with power derived from immense water-wheels, others by water-engines. Many of these machines are wonderful specimens of ingenuity. I have never yet seen in any American factory useful machines equal to many which are running every day in Geneva. If they were in the possession of some of the American Watch Companies, they would at once tell the world about their wonders, and also make a point of displaying them at universal exhibitions. But here in Switzerland no display is made with them; they are allowed to do their work silently and faithfully, and then exhibit to the world their products; and heretofore, there has never been any occasion for telling the people of the United States, or of any other country, anything about the superior qualities of these products. The world with eyes to see for itself might at once recognize this excellence as it always has done, until within the past few years the glaring and mendacious advertisements of the American Watch Companies have (Patent Quack Medicine style) filled the newspapers, and it is not to be wondered at that people at last look amazed, and in sheer perplexity ask "How is this?"

In order that you may not consider my expression in reference to American advertisements unjust, I may remark that some of the Watch Companies tell the public, through the press, that they make watches which run twelve months and longer, the total variation not exceeding two seconds during the entire time. It is surprising that they should not say twelve years, and longer, for it would be just as easy to print, and their watches might just as well be expected to run so many years as months, within two seconds. Further comment upon such trash would be superfluous, and I will at once revert to the subject proper.

Nor can Geneva alone boast of her elaborate machinery, and other facilities for watchmaking over other parts of Switzerland. In some of the mountain districts, for instance the Vallée-du-Lac-de-Joux, even there you will find watch factories furnished with the most improved machinery, and running by steam power. Where on the face of the globe can such wonderful specimens of complicated pieces, such as repeating and perpetual calendar watches, etc., be found as are made in that Vallée? And how, I would ask, could they be produced without the aid of machinery of the most elaborate kind?

In the face of these facts, I would ask: Is it not the very height of injustice to allow your remarks upon watch machinery in America (quoted above) to be published to the world? Can the public at large be accurately informed on the subject of the watch industry of different countries by perusing your advertised speech? or, can practical men of this or any other country derive any useful knowledge from it? And if it falls into the hands of those who have made the science of horology a life study, what would they do but put on a smile of incredulity and ridicule, when they read what you say about the adjusting of watches in America; for your words seem to convey the idea, if not to absolutely assert, that they possess the happy faculty of bottling up, as if by enchantment, all the different adjustments, even that freaky element in the hairspring (isochronism), and that they can be sprinkled about at will amongst watches, from the first down to the fifth grades.

There is too much of the mountebank nostrum about this to require serious comment. You cannot very well complain that I have overdrawn the picture, for you say: "They arrive at the regulation of the watch—so to say—without having seen it." You claim to be a manufacturer, and you must therefore concur with me when I state, that the regulation of a new watch includes all the adjustments.

I will now say a few words in reference to your statement to the effect that the Canton of Neuchatel has injured its reputation by sending cheap goods to the United States. I will at once admit the truth of your words in this particular, but I cannot do so without making some explanation.

It is a well known fact that there has, of late years, been a demand in America for a cheaper article, especially in ladies' watches, than could be furnished by the home companies. Some dealers found that they must have watches in gold cases, that they could sell for $18 and $20, also watches in silver cases that could be sold at retail for $5, $6 and $7. The Canton of Neuchatel responded to this call, and the goods were made and sent. This same thing has been continued for years, and is being done to this day. Who but the American people are to blame for this?

But now, after considering these facts, I will continue by stating that America, as well as other countries, has also called for a better watch than could be found at home, and Switzerland has, to her honor and credit, always been, and is now, responding, by sending such goods as *cannot* be made in any other country *at any price*. I can assure you that this will not be disputed for a moment by competent judges, either in England or the United States.

Take, if you please, the highest cost watch made in America, and compare it, piece by piece, with even the medium grades made either in Geneva or Locle. You will find both are made by machinery, the die, the millingtool, the lathe, etc., etc., have all played their part in one and in the other. In the case of the American production, the work on the movement ends when the machines have got through, where, on the contrary, much of the work on the Swiss watch only commences when the machines leave off. Just here is where skilled labor steps in, and by means of dexterous manipulation, the work of finishing is carried to a degree approaching the marvellous.

If any one, through ignorance or prejudice, should dispute these truths, let him take, for example, an anchor escapement from even the medium grades of Geneva watches, and place it by the side of one of the highest grades of American manufacture; the contrast will be too great to allow even the first word of dispute. The first is a wonderful work of art, and the other without even an apology for finish. The feeble excuse is sometimes advanced by the pretensions that all this elaborate finish is unnecessary, and that it does not add anything to the good performance of the watch. This, however, is too absurd to require a denial; but I will simply say that if this point should be granted them, then, to say the least, they are taking pay for work which they have left undone, and their plea is that it is good enough.

I would like to make a few comments upon the statistical portion of your speech, but I will defer it for the present, inasmuch as my letter has already extended beyond the limit to which I intended to carry it when I commenced.

Hoping to hear something from you in reply, I am,

Very respectfully yours, ALBERT H. POTTER.

The Dueber Watch Case Factory,

NEWPORT, KY.



AN INDISPUTED FACT!

The "DUEBER" Coin Silver Cases speak for themselves.

Dealers who wish to build up a reputation upon the merits of the goods they sell **can not** afford to be without them.

The Dueber Watch Case M'fg Co.

CINCINNATI AND CHICAGO.

Vulcanite Jewelry Co.

MANUFACTURERS OF

WHITBY JET,

Combination Whitby Jet and Vulcanite.

Byron's Patent, May 18, 1869.

Also a full line of Lockets—plain, gold mounted and monogram.

No. 191 BROADWAY, N. Y.

☞ Agents for the NEW RUBBER WATCH CASES. Fitting all American Movements.

CHARLES KNAPP,

Engraver, Diesinker and Stamper

FOR JEWELRY PURPOSES.

Manufacturer of Shanks and Heads for Seal and Diamond Rings.

Sample Cards always on hand.

☞ Superior Carved and Fancy Band and Children's Rings, with very elaborate designs, a Specialty.

☞ Fine Engraving and Enameling Work done.

41 Maiden Lane, N. Y.

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Gold and Silver Refiner,

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Sole Agent for Comins' Improved Amalgamators

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Crowns and Pushers in gold, all sizes, quality and color, made to order. Silver crowns and pushers always on hand.

☞ Samples sent on application.

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IMPORTER OF

Watch Materials,

TOOLS, GLASSES, SILK GUARDS,

Spectacles & Eye Glasses,

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Solid Gold Rings.

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For the past twenty-seven years I have made the manufacture of PLAIN GOLD RINGS a Specialty, and have given to every branch of the business my personal attention. I am, therefore, able to sell at the LOWEST CASH PRICES, and in every case guarantee the quality. I will send to any address, with proper reference, from 50 to 500 dwts., net cash, the goods to be returned if not found satisfactory. I also make Children's Rings, Silver Rings and Half-round Chased Rings. For uniformity, and the convenience of my customers, Allen's U. S. Gauge has been adopted as the standard in my manufactory. Parties desiring Single Rings can have them forwarded upon payment of 25 cents extra. Orders for all other jewelry filled at the Lowest Cash Prices. Old Gold received and refined, and $1.03 in gold allowed per pennyweight. Yours respectfully,

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Full line of new and original mountings on hand.

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Incrusted Goods a specialty.

All kinds of Lapidary Work promptly executed.

Leon Jeanne. Paul Jeanne.

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And RICH JEWELRY,

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Designs furnished and estimates given.

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Improved Gold and Silver

THIMBLES



AND THE PATENT

AUTOMATIC EYE GLASS HOLDER,

Which returns the Eye Glasses to their place on or under the lapel of the vest by simply casting them from the nose, combining all the conveniences of Cord, Hook and Case, without their annoyances.

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IMPORTER OF

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French Clocks, Musical Boxes, &c.

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Medal at Centennial, 1876.

CAMEO Likenesses,

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Manufacturers and Importers of

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Jewelry and Silverware Cases,

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J. D. YERRINGTON, Agent.

☞ Rough, Boart, Cabinet Specimens, Roses and Brilliants constantly on hand, and for sale.

☞ Fractured Diamonds repaired or recut for the Trade; also Rough Diamonds cut and fashioned to order.

BOURQUIN BROTHERS,

Manufacturers and Importers of Watches,

All Kinds of



WATCHES Made To Order.

NO. 20 MAIDEN LANE, N. Y.

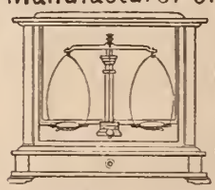
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Manufacturer of Fine Gold Scales,



DIAMOND SCALES,

☞ Bullion Balances and Weights, in use at all the U. S. Mints and Assay Offices.

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Solid Gold Rings----a Specialty

WM. H. ELY,

Solid Gold Rings

MANUFACTURER,

Viz., Plain, Chased, Engraved, Enameled, Engine Turned, Shield & Scale. *All qualities Warranted*

Orders Promptly Executed.

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Diamond, Pearl and Cameo Mountings

A SPECIALTY.

No. 19 John Street, New York.

☞ Designs furnished and estimates made. Particular attention paid to remounting.

W. H. LUDEMAN,

Chronometer & Watch

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Nos. 75 & 77 Nassau Street,

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☞Repairing of every Description for the Trade.

FINE WATCHES A SPECIALTY.

To the Trade.—I am now prepared to cut all kinds of Stem-Winding Wheels for the Trade.

F. W. C. Nieberg,

Repairer and Adjuster of

FINE WATCHES,

and Marine Chronometers,

No. 8 JOHN STREET

New York.

Blancard & Oberlander,

Manufacturers of all kinds of

Settings & Galleries

Of any Carats of Gold, Silver or Platinum,

36 & 38 John Street, New York

We respectfully call attention to our Platinum-lined Settings, as we refine and melt Platinum ourselves. Platinum scraps purchased or exchanged. ☞Please send for sample cards.

Stephen J. Cox

DESIGNER & ENGRAVER on WOOD

NO. 90 NASSAU STREET, NEW YORK.

Jewelers' Work A Specialty.

JNO. F. LUTHER.

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MANUFACTURER OF FINE PRESENTATION JEWELS FOR ALL SECRET SOCIETIES. KNIGHT TEMPLAR'S CROSSES KEY STONE MARKS SOCIETY SCHOOL AND

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Fine Hair Jewelry

And Device Work,

No. 32 John Street, New York.

Pattern books constantly on hand for the Trade

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Solid Gold Mountings for Hair Jewelry, kept constantly on hand, and made to order at shortest notice.

Orders from the country trade promptly attended to.

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Manufacturers of Gold Jewelry



Sole Makers of the Separable Sleeve and Collar Buttons in Gold.

No. 183 Eddy Street, PROVIDENCE, R. I.

ALBERT FRIEDENTHAL,

Importer and Jobber of

WATCHMAKERS' & JEWELERS'

Materials, Tools and Optical Goods

Real and Imitation Stones,

☞For Manufacturing and Repairing Purposes

A SPECIALTY.

Agent for TISDALE'S Watch and Clock Oils.

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Orders by mail will receive prompt attention.

JEWELLERS' PIN VISE.



The tool is made of Steel throughout, with the jaws and wearing parts hardened. Every part is made to guage. The finish is first-class and nickel-plated. Warranted to outwear at least three of the imported pin vises.

SOLD BY THE JOBBING TRADE GENERALLY.

☞Samples securely packed and sent post paid for $1.50 Satisfaction guaranteed or Money refunded.

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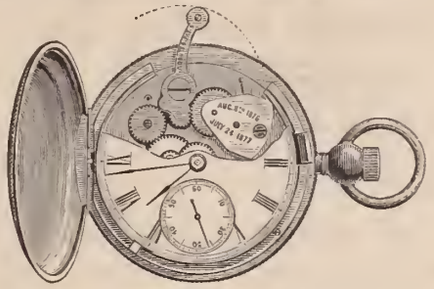


Watch Case Spring.

Each holder is accurately fitted to the Case, and in a few minutes the Spring can be adjusted. The Spring works evenly from end to end, and without strain or wear to the most delicate Case.

☞ The Spring is made of the Finest Steel, Drawn and Rolled Hard, which gives it sufficient temper, and so adjusted to the Holder that it retains its elasticity, is not liable to break, and is superior to all others, because it is adjusted to the Case without drilling new holes, as is frequently done with the old Springs. ☞$1.50 per dozen.

C. W. WADSWORTH, PEEKSKILL, N. Y.



ABBOTT'S

Patent Winding & Hand Setting Attachment

For American Full Plate Watches.

HENRY ABBOTT,

Patentee and Manufacturer.

Office, No. 11 Maiden Lane, N.Y.

Factory, 13 and 15 Franklin St., Newark, N.J.

Special facilities for altering from Key to Stem-winding Watches of any kind. Prices furnished on application.

WATCH WHEELS CUT TO ORDER.

☞Patentee and Manufacturer of **Abbott's Patent XII o'clock Stem-Winders,** for which Messrs. J. T. SCOTT & CO. are the SOLE AGENTS.

W. F. TREWIN,

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Watch Cases

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Jewelry.

☞Prompt and careful attention given to filling orders for all kinds of goods pertaining to the Trade. Goods sent on approval when satisfactory references are furnished.

☞Designs and estimates given, and special attention paid to orders from jewelers for Watches, Badges, &c., designed for presentation.

☞Every description of Watches and Jewelry carefully repaired for the Trade.

730 Chestnut Street, (up stairs),

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New Edition at a Reduced Price.

A New Monogram and Alphabet Album.

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Respectfully announce, that they have now ready a new edition of their well-known book of Monograms and Alphabets.

☞Engravers, Stationers, Carriage Painters, Jewelers, Gold and Silver Smiths, and Designers and Decorators generally, will find this book useful, saving time in drawing, and having available a book of suggestion and reference. A double set of Monograms is included, a number of Alphabets, also a few Heraldic Designs, Crests, Casques, &c.

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We print but a small edition, and early orders are suggested.

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☞ Sent by mail, prepaid, on receipt of price.

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HIGHEST DIPLOMA AND MEDAL
At the Centennial International Exhibition.

PHILADELPHIA
WATCH COMPANY

Incorporated in 1868.

E. PAULUS, President
A. C. RAEFLE, Treas.

Superior Watches,

☞ Great Reduction in Prices to meet the demands of the times.

☞ Price Lists furnished to the Trade on application with business card.

618 CHESTNUT STREET, PHILADELPHIA.

NEW YORK AGENCY:
L. H. KELLER & CO.,
No. 64 NASSAU STREET.

Established 1850.

Trade Mark.

PETER L. KRIDER,

MANUFACTURER OF
STERLING
SILVER WARE,

Medal and Diploma Awarded, &c.

Striking Society Medals in Gold, Silver or Bronze A SPECIALTY!

ARTISAN HALL,
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18 Size.
Stem Wind and Stem Setting Movements.

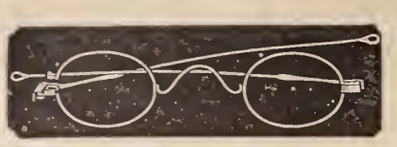


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Made especially for *Open Face* Cases, on order, by the ILLINOIS SPRINGFIELD WATCH Co., of any grade on their list, below "Miller adj.") *with figure XII at the Pendant, and Seconds opposite.*—"Interiors" made in this way are now in the stocks of wholesale dealers.

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(Successor to Albert Landsberg.)



IMPORTER AND MANUFACTURER OF

Optical Goods,

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Near Nassau Street, NEW YORK

Sole Agent for

BLACK'S PATENT

Interchangeable Spectacles,

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EYE GLASSES.

Jewelers and others who keep spectacles for sale will please observe that, with these PATENT SPECTACLES, it is only NECESSARY to have a full *Complete Assortment of Lenses and Pebbles*, which being all of a UNIFORM SIZE, will FIT either the Gold, Silver, or Steel Frames, of which but a few of each kind are wanted; an advantage which will give a complete assortment of the finest Spectacles, for one-sixth the capital invested in a like assortment of the same quality goods of the old style frames.

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GEO. W. DU BOIS,
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ROCHESTER, N. Y.

Importer and Dealer in Watch and Jobbing Materials, Tools, Glasses, Chains, Guards and Jewelry.

GUTMANN'S AUTOMATIC

HAMMER AND PUNCHES.



Patented January 8th, 1878.

This Tool takes the place of the third hand, therefore its manifold uses are quickly apparent, and I would only say, that it is accompanied by six punches, to-wit: 1 prick punch, 2 hand punches, 1 closing hole punch, 1 rivet punch, 1 pinion punch, all of which fit neatly into the punch holder, and are fastened by the set screw. Its tap is alternately heavy and light, and the finger loops are assortek in sizes The Tool is nickel-plated and boxed, ready to be mailed.

The operation is as follows: Insert your forefinger through the loop at the top and place the third finger as a guard on the lower end of the barrel, then with the thumb and second finger of the same hand, turn the cam ring which produces the concussion on the punch. This leaves the left hand free to hold the work.

Price, $2.50 Each.

☞ Sent by mail, post paid, by the manufacturer, or any first-class Tool Dealer, on receipt of price.

☞ Please send your order.

MAX L. GUTMANN, Patentee & Manuf't'r.

Watches and Watch Cases a specialty.

THE JEWELER AND METALWORKER.

A fortnightly Journal for Watch and Clockmakers, Gold and Silversmiths, Electroplaters, Cutlers, Opticians, and all branches of the Precious Metal Trades.

WM. ALLEN, EDITOR, 108 Barnsbury Road, London, N., England.

Subscription, per annum, FOUR SHILLINGS STERLING,

One Dollar Gold.

This Journal has a very large circulation among the above named and kindred trades in all parts of Great Britain and the Colonies and the U. S. of America and West Indies. A trial invariably proves its merits as an advertising medium. Terms for advertisements on application to the Editor.

Small amounts, for Subscriptions, etc., may be forwarded in U. S. Postage Stamps. Wholesale Publishers for this Journal. **Messrs. MARSHALL & SON,**
No. 125 Fleet Street, London.

☞ Specimen copies on receipt of Five Cents.

Journal Suisse d'Horlogerie,

A MONTHLY TRADE JOURNAL.

Published in Geneva, under the auspices of the Industrial and Commercial Departments of the Societe des Arts.

Devoted to the interests and for the advancement of Watchmakers and the art of Horology.

This periodical is under the supervision of a body of watchmakers, who have correspondents in the kindred branches of industry and sciences, who contribute the leading articles of interesting subjects and illustrations, publishes the reports of the different commercial and industrial societies, of which it is the organ, and is, owing to its great circulation all over the world, a valuable advertising organ.

☞ Subscription, 12 frances a year, (or $2.50). Orders received at the office of The JEWELERS' CIRCULAR.

Allgemeines Journal der Uhrmacherkunst.

Illustrirte Fachzeitschrift fur Uhrmacher.

Redacteur, Emil Schneider, Uhrmacher in Naumburg, Germany.

Agents for the United States, WM. MUHSAM, 316 W. Pratt St., Baltimore, and O. W. F. BURGER, cor 5th & Olive streets, St. Louis, Mo., who will give every information with regard to subscription and advertisements.

The "Allgemeines Jonrnal der Uhrmacherkunst" bas taken npon itself the task of elevating the art of watchmaking, and to protect and further the interests of the trade.

This Journal appears weekly, and, enjoying a great circulation all over the globe, is in a position to offer special advantages for advertisements.

Deutsche Uhrmacher Zeitung.

[Organ des Central Verbandes der Deutschen Uhrmacher]

Expedition: 48 Markgrafen Strasse, Berlin W., Germany.

Redacteur: R. STACKEL, Hof-Uhrmacher.

Agent for the United States, H. HOREND, 15 Maiden Lane New York City.

who will give every information regarding Subscription and advertisements.

The Journal is noted for really practical and scientific articles and an abundance of information concerning the requirements in the art and trade of watchmaking. It appears fortnightly, and the great circulation of the same amongst watchmakers in all parts of Germany and German watchmakers abroad, secures for advertisements the best possible effects. P. O. Box 3190.

SPECIAL NOTICES.

JOSEPH HOEY & CO., No. 658 Broadway, New York, Photo-Wood Engravers,—each article engraved immediately from the photograph. The best and only reliable method.

FOR SALE—An Universal Lathe, in perfect order, runs with spiral gear, has all attachments, etc. The lathe is nickel plated. Will sell it for $25 cash. Address C. B. Tonsley, Fort Atkinson, Wis.

THE advertiser, wishing to go South for health's sake, desires to sell his stock, fixtures, tools, etc., or would exchange the same with some Southern watchmaker. Address Jeweler, Box 29. Missouri Valley, Iowa.

WANTED, by a first-class General, Letter, Monogram and Ornamental Engraver, a position as Salesman and Engraver. Can furnish the best references for honesty and capacity. Address, Monogram, office of Jewelers' Circular.

FOR SALE—A well established jewelry busines of five years standing, in a thriving town of Central N. Y. Work alone will more than pay all expenses. $2,000 cash required. Address Jeweler, Lock Box 1, Moravia, Cayuga Co., N. Y.

WANTED—A permanent situation by a young man of over ten years experience. Would prefer to take charge of bench for some firm that wishes to do only good work. Can furnish unquestionable references. Address A. B. C., Jewelers' Circular.

J. C. SAWYER—Manufacturer of Gold and Plated Jewelry, Rings, &c. Orders by mail will receive prompt attention. Goods sent on selection to any part of the U.S. on receipt of N. Y. City references. Address all orders to J. C. Sawyer, Yonkers, N. Y.

$25. REWARD—To the person who will inform M. Garver, Nevada City, California and help him in getting his watch, stolen from him in San Francisco. Gold magic case, English lever. W. F. Leece. Great Sutton street. London. No. 24388.

FOR SALE—A book on "The Watch," 3d edition. Hand work vs. Machinery, etc: History of Watchmaking by Both Systems. by Henry F. Piaget, watchmaker. Price 25 cents. Post paid to any address on receipt of price by the author, Henry F. Piaget, 36 Maiden Lane, N. Y., or at the office of this Journal.

WANTED--By a young man, a situation as an apprentice to learn the watchmaking and jewelry trade. Has worked at the bench almost two years, can do hard soldering. Would work for a reasonable salary with a first class workman so as to become a thorough workman. Good references given. Address H. H D., Box 55, River Falls, Wis.

A THOROUGHLY first class watch repairer, jeweler and engraver is looking for an opportunity to invest money as a partner in some established jewelry business. Is competent to take charge of the mechanical or business department in city and will come on trial at first. A New England City preferred. References exchanged. Address Partner, Office of Jewelers' Circular.

HENRY F. PIAGET, Manufacturer, Examiner and Repairer of every description of fine stem and key winding watches. No. 36 Maiden Lane, N. Y. Pivots and jewels of any kind inserted. New pieces of every description made and fitted. Examining, repairing and cleaning done in the best manner. Send for price list of repairs on new pieces. etc. Estimates given, when required, before doing the work.

BUSINESS NOTICES.

L. Bonet, the well known cameo cutter, will remove to No. 889 Broadway during the latter part of this month.

The firm of Messrs. Saltzman & Co., importers of watches, have dissolved by mutual consent. Mr. Auguste Saltzman will succeed the late firm and liquidate its business affairs.

Mr. Henry C. Haskell, the well known manufacturer of artistic jewelry, has recently patented several unique designs in finger rings, which are attracting considerable attention. A glance at his advertisement will convey an idea of the novelties he offers, the assortment of which is large and comprehensive.

NEW YORK, February 4, 1878.

I have tested, chemically and otherwise, samples of W. F. Nye's chronometer, watch and clock oils, and I have found them as free from acid, gum, resin and other noxious substances as any oil which has been brought to my notice. They possess the necessary qualifications for a safe lubricator for timepieces in as great a degree as any offered in the market. H. REINECKE.

The Springfield Watch Co. announces the introduction of an attachment for open faced stem winding watches. This improvement consists of an extra pinion geared into the third wheel and securely braced by a spring. On reference to the Company's announcement elsewhere in this Journal, it will be noticed that the hours and seconds on this dial are in their respective positions, viz., Figure XII. at the pendant, and the seconds at Figure VI.

Buyer's Directory.

A Guide to the prominent Wholesale Houses in the Watch, Clock, Jewelry and kindred branches of Trade in New York, Philadelphia, Chicago, Providence and Newark.

NEW YORK.

Bohemian Garnet Jewelry.

Bissinger, Philip—Importer of Diamonds, Pearls and Precious Stones. Sole Agent for the Bohemian Garnet Jewelry, 22 John St.

Clock Companies.

Seth Thomas Clock Co. Manufacturers of Clocks of all kinds. Salesroom, No. 581 Broadway,

Ansonia Clock Company.—Nos. 19 & 21 Cliff street, and 5 Cortlandt street, N, Y.

Waterbury Clock Co.—M. Bailey, Treasurer, Manufs. and Jobbers, No. 4 Cortlandt Street, N. Y., and No. 197 State Street, Chicago.

Corals and Coral Jewelry.

Errico Bros.—Importers of Coral, Conch-Shell and Silver Filigree Jewelry, etc., 19 John St.

Granberry, T.—Specialty, Coral repairing for the trade, at reduced prices. Manufacturer of Coral and Black Onyx Jewelry. No. 51 Nassau street.

Lawson, Samuel.—Manufacturer of Fine Gold & Coral Jewelry; Coral Jewelry altered, refinished and repaired, No. 63 Nassau St., N. Y.

Cameo Cutters, Etc.

Bonet, L.—(Successor to Bernerd & Bonet), Cameo Likenesses, 599 Broadway, N. Y.

Habermeier & Wiederer—Engravers of Cameo Likenesses, Seal Stones. Cameos repaired. 23 John St.

Zwetsch, L.—Cameo Engraver. Likenesses cut from Photographs. No. 42 John street.

Charms & Gold Watch Keys.

Rupp & Held,—Manufacturing Jewelers, Charms and Gold Watch Keys, with French and English Ratchets, a specialty. 15 John st., N.Y.

Cutlery.

Harrison Bros. & Howson,—Manufacturers of Fine Ivory and Pearl Table and Pocket Cutlery. No. 26 Cliff street. W. C. Burkinshaw, Sole Agent.

Diamonds.

Anderson, Otis,—Diamond Broker and Commission Merchant. No. 9 Maiden Lane.

Bernhard, A. & Co.—Manufacturing Jeweler & Importers of Diamonds and Precious Stones, also Diamond Mountings, No. 169 Broadway, Gilsey building.

Bissinger, E—Importer of Diamonds, No. 192 Broadway. New York.

Bissinger, Philip—Importer of Diamonds, Pearls and Precious Stones. Agent for the Bohemian Garnet Goods No 22 John St., N.Y.

Buckenham, Cole & Saunders—Importers of Diamonds and other Precious Stones, No. 10 Maiden Lane, N. Y.

Fera, Henry—Importer of Diamonds, and Manufacturer of Fine Diamond Jewelry. No. 9 Maiden Lane, New York. Amsterdam, Holland, 23 Loojersgracht.

Herbert, R. J.—Importer and Broker in Diamonds, 24 John Street.

Morch, Jacob—Importer of Diamonds, Pearls, French & Italian Stone Cameos, Amethysts, Onyxes, and Precious Stones. Diamonds in pairs a specialty. No. 25 Maiden Lane, N. Y.

Neresheimer, E. Aug.—Importer of Fine Diamonds. No. 21 Maiden Lane, New York.

Diamond Cutters.

The Morse Diamond Cutting Co. of Boston.—Henry D. Morse, General Manager. N. Y. Office, 192 Broadway, corner John street. J. D. Yerrington, Agent.

Diamonds and Diamond Jewelry.

Bissinger, Philip.—Importer of Diamonds, 22 John street, N. Y. Agent for the Bohemian Garnet Goods.

Bornemann, Louis—Manufacturer of Diamond Jewelry from original designs, 169 and 171 Broadway.

Heller & Bardel—Manufacturers of Diamond Jewelry, and Dealers in Diamonds, No. 13 John street.

Smith, Hedges & Co.—Importers of Diamonds Exclusively, and Manufacturers of Fine Diamond Jewelry, 1 Maiden Lane.

Taylor & Brother—Importers of Diamonds and Diamond Jewelry, 676 Broadway.

Diamond Setters, Etc.

Asher, J.—Jeweler and Diamond Setter, Precious Stones Inlaid and Incrusted with Diamonds, Nos. 880 and 882 Broadway.

Blancard & Oberlander—Manufacturers of all kinds of Scttings and Galleries of any carat of Gold, Silver, Platinum and Platinum Lined. Send for sample cards. 36 and 38 John street, N. Y.

Friend, S.—Manufacturer of Fine Jewelry, and Diamond Setter. 33 John street, N. Y.

Dials, &c.

Caesar Brothers—Manufacturers of Enameled Clock Meter and Gauge Dials, Patent Door, Coffin and Pew Plates, Druggists' Labels, &c. No. 32 and 34 John Street.

Gold, John T.—(Successor to the late T. Gold), Enamel Watch Dial Maker, 81 Nassau St.

Enamelers, Etc.

Nutt, J. D.—Enameler on Gold, Silver and Copper, 32 and 34 John St. Birds, Flowers, etc., Enameled in colors.

Orr, Jas. C.—Enameler on Fine Jewelry, Flowers, Birds, &c., Enameled in colors. Band Bracelets (a specialty). 77 Nassau Street.

Electroplaters, &c.

Jeandheur, F. & Son,—Gold and Silver Electro Platers & Fire Gilders, coloring Etruscan and Gold Jewelry a specialty. 117 Fulton St.

Engravers and Die Sinkers

Fackner, Edward—Carver, Engraver and Chaser on Jewelry and Pencil Cases. Monograms Lettering, &c. 19 John Street.

Knapp, Charles—Engraver, Die Sinker & Manufacturer of Band Rings. 14 and 18 kt. Shanks and Heads for Rings, &c., 41 Maiden Lane.

Schuller, J. Dan'l—Stone Seal Engraver, Arms Crests, Initials and Monograms engraved on Stone Seals, &c. 71 Nassau street.

Fancy Goods, Clocks, Bronzes, Etc.

Hinrichs, C. F. A.—Importer and Dealer in French, English and German Fancy Goods, etc., etc. 29, 31 & 33 Park Place, N. Y.

Magnin, Ve J. Guedin & Co.—Importers of Clocks Bronzes, Musical Boxes & Rich Fancy Goods etc., 652 Broadway.

Le Boutillier & Co.—Importers of Fancy Goods, Clocks, Bronzes, &c. 3 Union Square

Gold Chains, Etc.

Beck, J. & Son, Manufacturers of Fine Gold Chains and Chain Bracelets, 10 Liberty place, near Maiden lane, N. Y.

Dorrance, Edge & Co.—Manufacturers of the Celebrated Woven Fabric Gold Chain, No. 9 John street.

Hamiltons & Hunt.—Manufacturers of Fine Plated Chains and Patent Buckle Bracelets. Branch office, 176 Broadway. Factory, 226 Eddy street, Providence.

Hodenpyl, Tunison & Co.—Fine Gold Chains and Jewelry, 170 Broadway, N. Y.

Kaufmann Bros.—Manufacturers of Gold Chains, and Chain Bracelets, 26 John street; Factory, 331 and 333 Bowery, N. Y.

Nord & Schlag,—Manufacturers of Gold Chain. No. 366 Broome St., N. Y.

Saxton, Smith & Co.—Manufacturers of Fine Gold Chain. 194 Broadway.

Gold Pens, Etc.

Aikin, Lambert & Co.—Manufacturers of Choice Gold Pens, Cases, Holders, Toothpicks, etc., 12 Maiden Lane, N. Y.

Mabie, Todd & Bard—Manufacturers of Gold Pens, 180 Broadway.

Todd, Edward & Co.—Manufacturers of Gold Pens, Pencil Cases, Tooth Picks, &c., 652 Broadway, N. Y. Factory, Brooklyn.

Goldsmiths, &c.

Greene, Wm. C. & Co.—Goldsmiths; Manufacturers of Rich Sets in Taper Wire Coral. Office, 18 John street.

Gold Rings.

Bowden, Joseph B.—Manufacturing Jeweler.—Solid Gold Rings a specialty, 11 Maiden Lane.

Ely, W. H.—Manufacturer of Solid Gold Rings of every description. No. 58 Nassau Street.

Hair Jewelry.

Bernhard, A. & Co.,—Manufacturers of Fine Hair Jewelry and Device Work. The latest styles 169 Broadway, Room 3, New York.

Menge, Chas. T.—Manufacturer of Fine Hair Jewelry and Device Work. No. 32 John St.

Schwencke O.—Manufacturer of Fine Hair Jewelry. Orders from the country promptly attended to. No. 43 Maiden Lane.

Jewelry Cases, Fancy Boxes, Etc

Braun, Chr. E.—Manufacturer of Jewelry Boxes, Trays for Show Cases, &c., 62 Chatham stt.

Dahlem, W.--Manufacturer of Cases for Jewelry and Silverware, No. 85 Nassau Street, N. Y Show Case Trays, &c., at the shortest notice

Wiggers & Froelick—No. 60 Nassau street.—Manufacturers of Cases for Jewelry, &c., of every description. Trays for Show-cases, Stands for Show-windows, etc. Jewelers' Traveling Cases, light, convenient and s ong.

Jackson, Samuel C.—Manufacturer of Box and Trays, for Silverware, Watches, Jewelr &c. 180 Broadway, N. Y.

Sturn, L—Manufacturer and Importer of C es for Jewelry, Watches, Silverware, &c. No. 15 J ohn street, N. Y.

Welch & Miller—Manufacturers of Morocco, Velvet, and Satin Jewelry Cases, Trays, &c. Complete stock on hand. 169 Broadway.

Jewelry—Fine.

Aikin, Lambert & Co.—Manufacturers. General stock of Reliable Jewelry, 12 Maiden Lane.

Alford, C. G. & Co., Manufacturers. General line fine and reliable goods. Specialties in Onyx goods and chain. 183 Broadway, New York.

Andrews, J. F—Manufacturer of Fine Jewelry, Lockets, Sleeve Buttons and Rings in Stone Cameo, etc., a specialty. 35 Maiden Lane.

Baldwin, Sexton & Peterson,—Manufacturers Fine Jewelry. Whiting Building, Broadway and Fourth street.

Ball, Wm. H. Manufacturing Jeweler. Fine Gold Bracelets a Specialty. No. 9 John St., N. Y.

Barthman & Straat—Manufacturers of Fine Jewelry. Seal and Stone Rings a Specialty Orders promptly attended to. 41 Maiden L

Bissinger, E. — Importer of Fine Jewelry, Lockets, Crosses, Neck Chains, &c., No. 192 Broadway.

Brown, Thos. G.—Manufacturer of Rich Jewelry Necklaces, Lockets, Bracelets, Sleeve Buttons, etc., 9 Bond street, N. Y.

Brainerd, Steele & Co.—Manufacturers of Fine Jewelry and Brainard's Patent Lockets. No. 9 Maiden Lane, New York.

Burch, Geo. & Co.—(Successors to Burch, De Mott & Coughlin,) Manufacturing Jewelers, 17 Maiden Lane, N Y. Factory, Newark, N.J.

Carrow, Crothers & Co.—Manufacturers of Fine Jewelry, Roman Band Bracelets, Lockets, Crosses, &c. 12 John Street, N. Y.

Carter, Howkins & Sloan.—Manufacturing Jewelers, Whiting Building, 4th St. & Broadway

Colby & Johnson.—Manufacturers of Fine Jewelry, and Importers of Watches. No. 17 Maiden Lane.

Chatellier & Spence,—Manufacturing Jewelers. No. 652 Broadway, N. Y.

Coe, Pinneo & Stevens.--Manufacturers of Fine Jewelry, Fine Gold Lockets and Linen Finished White Enameled Goods a Specialty, No. 9 Maiden Lane, N. Y.

Chatterton & Dodd—Successors to Fitch & Chatterton, Manufacturers of Fine Gold Jewelry, Chains, Band and Chain Bracelets, No. 19 John street, N. Y.

Demmert Bros. & Co.—Manufact'rs & Importers of Fine Jewelry, Cameo and Onyx Lockets, Sleeve Buttons and Sets a specialty. Old No. 9 Maiden Lane, New York.

Field & Co.—Manufacturing Jewelers, 8 Maiden Lane, N. Y.

Frankel & Folkart,—Manufacturing of Seal, Cameo and Amethyst Rings, a Specialty. Ladies' and Gents' Lockets, Cameo Sets, &c. Also a full line of Diamond Settings, 192 Broadway, cor. John street, N. Y.

Geoffroy, A. R—Manufacturing Jeweler, No. 10 Maiden Lane. Manufacturer of Geoffroy Patent Stone Lined Sleeve Buttons, Studs and Collar Buttons.

Goddard, John M.—Manufacturing Jeweler,—Seal Rings and Fine Lockets a specialty, No. 25 Maiden Lane, N. Y.

Goldsmith & Schliesser,—Manufacturing Jewelers and Importers of Diamonds and Watches. No 5 Maiden Lane.

Greason, Bogart & Pierce, successors to Arthur, Rumrill & Co., 182 Broadway, manufacturers of fine jewelry and gold chains

Griffith, H.—Manufacturer of Fine Jewelry. Studs a Specialty. Nutry Alley, Adams near Concord St., Brooklyn.

Howard, H. & Co.—Manufacturing Jewelers No. 14 John St., N. Y.

Hedges A. J. & Co.--Manufacturing Jewelers 9 Maiden Lane.

Hartmann, P.—Manufacturer & Importer of Fine Gold, Diamond, and Filagree Silver Jewelry, No 36 Maiden Lane. P. O. Box 2,454.

Haskell, H. C.—Manufacturing Jeweler. Seal Rings a specialty. Special attention to Jobbing of every description. 12 John street.

Hunt & Owen.—Manufacturing Jewelers. Office, 5 Maiden Lane.

Hale & Mulford,—Manufacturers Rich Jewelry, Whiting Building, Broadway and 4th Street.

Jeanne Brothers.- Manufacturers of Diamond Mountings & Rich Jewelry. 1 Maiden Lane.

Kipper, Vogel & Co.—Manufacturers of Fine Jewelry. Etruscan Goods a specialty. No. 17 Maiden Lane.

Keller, Chas. & Co.—Manufacturing Jewelers Lockets a Specialty. No. 13 John St., N.Y.

Krements & Co.—Manufacturing Jewelers, No. 13 John Street, N. Y.

Kuhn & Doerflinger—Manufacturers of Enamel'd and Roman Band Bracelets, also Fine Lockets and Pendants, 18John street.

Lennon, John D.—Manufacturing Jeweler, 142 Fulton street. Flat, and Half-round Gold Bracelets, Roman and Stone Lockets.

Moore & Horton.—11 Maiden Lane, Manufacturing Jewelers, Rings, Studs, Collar and Sleeve Buttons, Pins, Ear-rings, &c.

Mitchell, Noah—Manufacturer of Fine Gold Jewelry, 694 and 696 Broadway, N. Y.

Miller Bros.—Manufacturers of Fine Jewelry Lockets, Sleeve Buttons, Studs, etc., etc. 11 Maiden Lane, New York.

Mulford & Bonnet—Manufacturing Jewelers and Jobbers, 21 & 23 Maiden Lane, N. Y. Particular attention given to Jobbing and Special orders.

Maass, Cook & Groeschel—Manufacturers of Fine Jewelry and Lockets, 191 Broadway, (over Mercantile Bank,) N. Y.

Marx Kossuth & Co.—Manufacturing Jewelers 39 Maiden Lane.

Owen, G. & S. & Co.—Manufacturing Jewelers. Office, No. 5 Maiden Lane.

Riker, William—Manufacturer of Jewelry. Inlaid Gold Jewelry a Specialty. No. 5 Maiden Lane, N. Y.

Riley, J. A. & Co.—Manufacturing Jewelers, Etruscan Gold and Coral Sets, Roman Bracelets, Necklaces, etc. Onyx Goods a specialty. 7 and 9 Bond street, New York.

Richardson, Enos & Co.—Manufacturers of Fine Gold Jewelry, Gold Chains, Lockets, Crosses and Necklaces. Colored and Etruscan Work. No. 23 Maiden Lane, New York.

Richardson, J. W. & Co.—Manufacturers of Jewelry, Masonic and other emblems. 196 Broadway, Manufactory, Providence, R.I.

Sexton & Cole—Manufacturing Jewelers, Colored Gold and Onyx Goods a specialty. No. 30 Maiden Lane.

Shoemaker & Co.—Manufacturing Jewelers, Cameo Buttons, and Lockets, Roman Gold Goods, etc. No. 21 Maiden Lane, N. Y.

Stites, E.—Manufacturer of Fine Jewelry. No. 12 Maiden Lane, N. Y.

Sturdy Bros. & Co.—Manufacturers of Jewelry, No. 14 Maiden Lane, New York.

Thoma, Ernest—Manufacturer of Fine Jewelry. Sleeve Buttons, Rings, Ear-rings, &c. No. 173 Broadway, N. Y. Factory, Hackensack, N. J.

Tri r Bros. & Co.—Jewelry. Optical, Rubber, Jet, Shell, Ivory, Amber and Pearl Goods. Silk Guards, Japanese Bamboo Watch Chains a Specialty. No. 15 Maiden Lane.

Vulcanite Jewelry Co.—Manufacturers of Whitby Jet and Vulcanite Jewelry, 191 Broadway, N. Y.

Wadsworth, E. E.,—Manufacturer of Rich Jewelry and fine Rolled Plate. Fine Seal Rings a specialty. 35 Maiden Lane.

Wheeler, Parsons & Hays.—Manufacturers of Fine Jewelry, Watch Cases, Gold Chains, &c and Dealer in American and Swiss Watches, No. 2 Maiden Lane, N. Y.

Wienhold, Joseph—Manufacturer of Fine Jewelry and Diamond Setter. 24 John St.

Wilson & Brown—Successors to Dellerc & Co. Manufacturers of Fine Jewelry, Enameled Goods a specialty. 113 Fulton street, opposite Dutch street.

Woglom & Miller—Manufacturing Jewelers, Nos. 32 & 34 John street, N. Y. Specialty, Black Onyx goods.

Jewelry—Rolled Plate, Celluloid, &c.

Celluloid Novelty Co.—Manufacturers of Imitation Coral Jewelry, 4 Maiden Lane.

Jewelry Glasses.

Brown, Edwin — Lapidary. Manufacturer of Glasses, for all kinds of Jewelry, Clocks, Chronometers, &c. Glasses bent to any shape. No. 85 Nassau st.

Jewelers' Boxes.

Dennison & Co.—Manufacturers of Jewelers Findings, Paper Boxes, Cards, Tags, Cottons, Tissue Papers, &c., 198 Broadway, N. Y.

Frasse & Co.—Importers of Stubs, French, Swiss, German and Sheffield Tools, Files and Steel Wire for Watchmakers, Jewelers, etc., 62 Chatham street, N. Y.

Hammel, L. & Co.—Importers of Materials and Tools for Watchmakers, Jewelers and Engravers—also Optical Goods, &c., 9 Maiden Lane, N. Y.

Zimmern, Henry—Importer of Watch Materials, Tools, Glasses, Silk Guards, Silver & Plated Chains, Optical & Fancy Goods, 8 Maiden L

Lapidaries.

Kordmann & Michel—Lapidaries, dealers in Precious Stones. Rubies, Sapphires and Peridots cut. No. 32 Maiden Lane.

Musical Boxes.

Paillard, M. J. & Co—Importers & Manufacturers of Musical Boxes, No. 680 Broadway, N. Y.

Opticians.

Burbank Manf'g Co.—Manufacturers of Spectacles and Eye Glasses of all descriptions, in gold, silver, etc., 14 Maiden Lane, N. Y.

Du Bois, Geo. W.—Successor to A. Landsberg, Importer and Manufacturer of Optical Goods 36 Maiden Lane, Box 3993, N. Y.

Hammel, L. & Co.—Importers of Spectacles, Opera and Marine Glasses, Telescopes, Microscopes, Optical & Fancy Goods, 9 Maiden L.

Laurencott, J. B.—Importer of Watch Glasses, Optical and Fancy Goods, Clocks, Bronzes, etc., 33 Maiden Lane, N. Y.

Lorsch, Albert—Manufacturer of the Patent Accommodating Spectacles and Eye Glasses in Gold, Silver and Steel, and other Optical Goods, 37 Maiden Lane, N. Y.

Spencer Optical Manufacturing Co.—Gold, Silver, Steel and Nickel Plated Spectacles, Eye Glasses, &c. 13 Maiden Lane, N. Y.

Sussfeld, Lorsch & Co.—Optical and Mathematical Instruments, Watchmakers' Tools, Materials, &c. 13 Maiden Lane, N. Y.

Suttie, Wm. J.—Manufacturer of Eye Glasses and Spectacles, in gold, silver, steel and shell, (Price List by mail). 39 Maiden Lane.

Precious Stones, &c.

Fissinger, Philip—Importer of Diamonds, Pearls and Precious Stones. Agent for the Bohemian Garnet Goods. No. 22 John St., N. Y.

Gruet, Jules.—Importer of Precious and Imitation Stones, Amethysts, Topazes, Cameos, Garnets, Doublets, Imitation Diamonds, Pastes, etc., No. 14 John street. Manufactory at Septmoncel, France.

Meyer, Francis Ed. —Successors to John B. Behrmann, Importer of Imitation Precious Stones, all sizes and shapes constantly on hand. No 38 Dey street, P.O. Box, 1981.

Rings and Shanks.

Bryant & Bentley..Manufacturing Jewelers, 350 Patterns Hard Solder Rings, 12 Maiden Lane

Knapp, C.—Manufacturer of Band Rings of 14 and 18karat, Gold Shanks & Heads for Rings. 41 Maiden Lane.

Silverware.

Gorham Manufacturing Co.—Union Square.

Whiting Manufacturing Co.—Manufacturers os Sterling Silverware, cor. Broadway & 4th st.

Wood & Hughes.—Manufacturers of Fine Silver ware. 14 John Street, N. Y.

The Adams & Shaw Co.—Manufacturers of Silverware. Cor. Broadway & 4th St., N. Y.

Silver Plated Ware.

Hall, Elton & Co.,—Manufacturers of the Finest Electro-Plated Ware, salesroom, 75 Chambers street, N. Y.

Holmes, Booth & Haydens—Manufacturers of Silver-plated Ware. 47 Chambers street.

The Adams & Shaw Co.,—Silversmiths, Whiting Building, cor. Broadway & 4th street, N. Y.

Meriden Britannia Co—Manufacturers of Silver plated Ware, Union Square, N Y.

Middletown Plate Co.—Manufacturers of Superior Electro-Plate. Factories, Middetown, Conn., Salesroom, 13 John Street

Manhattan Silver Plate Company.—Manufacturhrs of every description and quality of Silver Plated and Bronze Ware, office No. 952 Broadway. Factory 382 to 390 2d Ave.

Reed & Barton—Manufacturers of Fine Plated and Table Ware, of every description, 686 Broadway, N. Y.

Rogers & Bro. — Manufacturers of the finest quality of Electro-Plated Ware. 690 B'way.

Simpson, Hall, Miller & Co.—Manufacturers of Fine Silver Plated Ware, No. 676 Broadway,

Webster, E. G. & Bro.—Manufacturers of Fine Silver Plated Ware. Office and Warerooms, 14 Maiden Lane, N. Y.

Show Cases, Etc.

Kelly, P. J.—Manufacturer of all kinds of Show Cases, Counters and Refrigerators, No. 50 New Bowery, N. Y.

Kraft & Hoffmeister—Manufacturers of Metal Show Cases, Jewelry Trays always on hand, 8 & 13 North William street, N. Y.

Smith, B. & W. B,—Patent Improved Counter Show Cases. Drawings furnished and estimates given for fitting stores in Cabinet Work complete.

Spectacle Case Manufacturers.

Koenen, A. & Bro. Manufacturers of Leather Spectacle & Eye Glass Cases, 81 Nassau St., N. Y

Thermometers Etc.

Tagliabue, Giuseppe—Thermometer, Barometer and Hydrometer Manufacturer, 302 Pearl street near Beekman, N. Y

Thimble Manufacturers.

Burbank Manuf'g Co.—Manufacturers of Gold & Silver Thimbles, 14 Maiden Lane, N. Y.

Ketcham & McDougall—Improved Gold and Silver Thimbles, Nos. 4 and 6 Liberty Place, near Maiden Lane, N. Y.

Walking Canes.

Fradley, J. F.—Manufacturer of Fine Gold and Silver-headed Walking Canes and Sterling Silverware. Office and Factory, No. 21 John street, N. Y.

Watch Companies.

American Watch Co.—Robbins & Appleton, No. 9 Bond street, N. Y.

Hampden Watch Co.—of Springfield, Mass. Office, No. 12 John St., New York.

Springfield Watch Co.—Factory, Springfield, Ill. Office, 11 Maiden Lane.

Tiffany & Co.—Makers of Fine and Complicated Watches. Office 14 John street, N. Y.

Watch and Chronometer Jeweler.

Queen, James—Watch and Chronometer Jeweler and Pallet Maker, 78 Nassau street, Room 8. Pivots inserted in Pinions, Balance, Staffs, &c.

Watch Importers, Etc.

Aikin, Lambert & Co.—Importers of Watches, Sole Agents for Paul Breton & Chas. Latour, Geneva. A general line of reliable Swiss Watches. Watch Cases of all styles made to order. 12 Maiden Lane, N. Y.

Bartens & Rice—Importers of Watches, Watch and Chrometer Makers. No 3 John street.

Beguelin, Tell A.—Importer of Watches, Watch Materials, Tools, etc. No. 71 Nassau St.

Bodine, G. M.—Importer and Dealer in Watches and Jewelery, etc., also Agent for Bard & Bros.', Gold Pens & Pencils, 22 Maiden Lane.

Bourquin Brothers—Importers of Watches from their own manufactory at Bienne, Switzerland, 20 Maiden Lane, N. Y.

Bynner, T. B.—Importer and Jobber of Watches, Diamonds and Fancy Goods, and dealer in the best class of Rolled Plate Jewelry. 513 Broadway.

Gagnebin, Chas.—Importer of all kinds of Watches, 64 Nassau Street. Agent for Ulysse Breting's Fine Chronometers, Chronographs, Anchors, etc.

Cross & Beguelin—Importers of Watches, Watch Tools and Materials, dealers in American Watches, No. 21 Maiden Lane, N. Y.

Deraismes Brothers—(Successors to L. A. Lutz and Lutz Bros.) Manufacturers and Importers of Watches. Fine movements a specialty. 182 Broadway, N Y. Factory in Locle.

DuBois, Francis & Co.—36 Maiden Lane, N. Y., Importers of Watches and Manufacturers of Watch Cases.

Droz, Henry E.—Importer of Watches and Watch Case manufacturer. Agent for the "E. Perregaux" Watch, and jobber in American Watches, No. 92 Fulton Street, N. Y.

Freund Max & Co.—Importers of Watches Jewelry and Precious Stones, 8 Maiden Lane

Ginnel, Henry—Importer of Watches, Tools and Materials. No. 31 Maiden Lane, N. Y. P. O. Box, 2967

Keller, L. H. & Co.—(Successors to G. A. Huguenin,) Importers of Fine Watch and French Clock Materials, No. 64 Nassau street, N. Y.

Hyde's Sons, John E.—Wholesale Commission Agents only, for Jules Jurgensen, of Copenhagen, Ed. Perregaux, Locle, Monard Freres, Geneva, Watches, and of other makers of every quality. No. 22 Maiden Lane

Kahn, L. & M.—Importers of Watches, No. 10 Maiden Lane, New York.

Mathez, F. H.—Importer of Watches. No. 5 Maiden Lane, N. Y.

Magnin, Ve J. Guedin & Co.—Importers and Agents of the Nardin Watch, No. 652 B'way

Mathey, L. & A.—Importers of Fine Watches and Sole Agents for the **H. L. Matile's** Watches, No. 119 Fulton Street, N. Y.

May & Stern—Importers of Foreign Watches, Materials and Tools, etc. Manufacturing Jewelers. No. 19 John St., N. Y.

Nicoud & Howard,—Importers and Manufacturers of Watches, No. 14 John street, N. Y.

Oppenheimer Bros. & Veith, Dealers in Watches and Diamonds, and Manufacturing Jewelers. No. 35 Maiden Lane, N. Y.

Quinche & Krugler.—Agents for the Borel & Courvoisier Nickel Movements, 17 Maiden Lane, N. Y.

Robert, J. Eugene—No. 9 Bond street, New York Agent for Louis Audemar's celebrated watches.

Schwob, Adolphe—Manufacturer & Importer of Watches, 11 Maiden Lane, N. Y.

Saltzman & Co.—Manufacturers and Importers of Fine Swiss Watches, 15 Maiden Lane, (up stairs,) N. Y. Factory, Chau de-Fonds, Switzerland.

Stern Brothers & Co.—Importers of Swiss Watches and wholesale dealers in American Watches, &c., 30 Maiden Lane.

Scott, J. T. & Co.—Importers of Watches, and Manufacturers of Jewelry, and Jobbers of all grades American Watches. No. 11 Maiden Lane, N. Y.

Strasburger, Louis & Co.—Importers and Makers of Watches of every description. No. 15 Maiden Lane.

Tiffany & Co.—Makers of Watches. General Agents for Patek, Phillippe & Co. Wholesale office, 14 John street, N. Y.

Watch Cases.

Brown, J. A. & Co.—Manufacturers of The Ladd Patent Stiffened Gold Watch Cases, &c., 11 Maiden Lane, N. Y. Factory, 58 Eddy street, Providence, R. I.

Laurent, J.—Watch Case Manufacturer, Gold and Silver American Watch Cases constantly on hand. 17 John street, N. Y.

Watch and Chronometer Repairer.

Cerf, B.—Practical Watchmaker and Repairer, No. 10 John street, N. Y. Repairing and adjusting of Fine Watches done for the trade. All kinds of escape and stem winding wheels cut to order.

Ludeman, W. H.—Chronometer and Watchmaker. Repairing of every description for the Trade. 75 and 77 Nassau street, N. Y

Sirois, A.—Practical Watchmaker, 75 and 77 Nassau street (Room 18), N. Y. Special attention paid to the repairing of Fine Watches. Pivots inserted.

Watch Case Repairers.

Tarbox, Hiram—Watch Case Repairing, Springing, Polishing and Engine Turning, 79 Nassau street, (room 22), N. Y.

Renaud, F.—Watch-Case Repairer.—Solid and Heavy Rolled Plate Bows and Pendents. Springer and Engine Turner of Cases and Jewelry, 36 Maiden Lane

Watch Guards.

American Silk Guard Manufacturing Co.,—Our goods are warranted all silk.—Kossuth Marx & Co. No. 39 Maiden Lane, N. Y.

Watch Glasses, Shades, Etc.

Hill, Robert S.—Manufacturer of Watch Glasses, &c, dealer in Imported Glasses, Flat Glasses a specialty; also, Jeweler's Glasses. Nos. 75 & 77 Nassau street, N. Y.

CINCINNATI.

Oskamp, Clemens.—Manufacturing Jeweler and Silversmith, Importer and Wholesale Dealer in Watches, Clocks, Materials, &c., 175 Vine street, Cincinnati, Ohio.

PHILADELPHIA

Booz & Thomas.—Manufacturers of Gold and Silver Watch Cases and Jewelry, 108 South 8th Street, Philadelphia.

Bennett, Jacob & Son,—Diamond Setters and Manufacturing Jewelers. 108 South 8th St., Philadelphia, Pa.

Conover David F. & Co.—American Watches, Wholesale Salesroom, southeast corner 7th and Chestnut streets, Philadelphia.

Hagstoz & Thorpe.—Manufacturers of Boss' Patent Stiffened Gold Watch Cases. Ledger Building. N. Y Office, 13 John street.

Herold, Chas P.—Successor to Hildebrandt, Herold & Co., Manufacturing Jeweler and Diamond Setter. Diamonds. 916 Chestnut St.

H. Muhr's Sons.—Manufacturing Jewelers, Solid Gold Rings a specialty, 158 North Second st. New York Office, 11 Maiden Lane.

Rolb, G. F. & Son.—Manufacturer of fine Morocco, velvet and Cabinet Cases for jewelry watches and Silverware. 722 Sansom street.

Krider, Peter L.—Manufacturer of Sterling Silver Ware, Artisan Hall, No. 618 Chestnut street

Liechty, D. & Co—Manufacturers of gold and silver watch cases, and importers and dealers in Swiss and American watches, 402 Library street, Philadelphia.

McCall & Newman—Manufacturing Jewelers, Filled Plain Gold Rings a specialty, No. 625 Arch street.

Morgan & Headly. — Manufacturing Jewelers Cameo sets, Gold sets, Roman Lockets, Rings, Coral sets, and a general line of rich goods. 611 and 613 Sansom street, Philadelphia.

Pequignot, C. & A.—Manufacturers of Watch Cases, and dealers in American and Imported Watches. 22 S. Fifth street, Philadelphia.

Rosenthal, G. F. C.—Manufacturing Jeweler and Diamond Setter. Engraving and Designing of Monograms a Specialty. No. 924 Chestnut street, Philadelphia.

Scherr, L. A. & Co. Wholesale Dealer in Watches Silver Plated Ware, Spectacles, Fancy Goods, Watch Materials, etc., 726 Chestnut street.

Simons, Brother & Co.—Manufacturers of Gold and Silver Headed Canes and Gold and Silver Thimbles. 611 & 613 Sansom St., Phila.

The Philadelphia Watch Co.—No. 618 Chestnut Street, Philadelphia. New York Agency, L. H. KELLER & Co., 64 Nassau St.

CHICAGO.

American Watch Company, of Waltham, Mass. No. 170 State street, Chicago.

Charpier & Wathier.—Watchmakers and jewelers for the trade, and dealers in all kinds of watch materials. 61 West Kinzie street.

Dexter, W. W.—Watchmaker for the Trade Repairer of Fine Watches, Chronometers French Clocks, Music Boxes, &c. Room 32, Tribune Building, Chicago.

Frese, B.—Watchmaking and Repairing for the Trade promptly attended to. Stem-winding and escape wheels cut to order. No. 99 E. Madison St., Chicago, Ill.

Purdy, J. H. & Co.—Jobbers of large and small Tools and Materials, for the use of Watchmakers, Jewelers, and kindred Trades. Spectacles—Jewelry Boxes, Plated Chains, &c., &c. No. 170 State street.

PROVIDENCE

Cooke, Daniel S. & Co.—Manufacturers of Solid Gold Initial Sleeve Buttons, Lockets, Cuff Pins, Rings, &c. 102 Orange Street.

Irons, Chas. F.—Manufacturer of Solid Gold Jewelry. Specialty Emblems, Pins and Charms Masonic, Odd Fellows, &c. 102 Friendship St.

Perkins, C. H.—Successor to Davis, Platt & Co., Manufacturer of Fine Gold Jewelry. Specialty, Ladies' Setts, Brooches and Earrings. No. 20 Conduit St., Providence, R. I.

Potter, Charles L.—Manufacturer of Pearl Shell Goods, Patent Spiral Studs a specialty, 407 Pine street, Providence, R. I.

NEWARK.

Condit, Hanson & Van Winkle.—Manufacturers of Machines for Electro-plating, &c.

Lefort, Henry.—Stem-winding Watch Crown Manufacturers. 80 & 82 Marshall St.

Lelong, L. & Bro.—Gold and Silver Refiners, Assayers and Sweep Smelters, S. W. corner Halsey & Marshall streets, Newark, N. J.

Milne & Jourdan—Manufacturers of Stem-winding Watch Crowns Nos. 13 & 15 Franklin Ave., Newark, N. J.

Prince, David—Gold and Silver Refiner, Assayer and Sweep Smelter. Sole Agent for Comin's Improved Amalgamator. 63 Railroad Ave.

Van Houten, Sayre & Co.—Manufacturing Jewelers, 53 Chestnut street, Newark, N. J.

HAMPDEN WATCH COMPANY,

SPRINGFIELD, MASS.

Manufacturers of all Grades of Full and 3-4 Plate

Key and Keyless Movements.

New York Salesroom & Office, 12 Maiden Lane.

The Jewelers' Circular and Horological Review.

The recognized organ of the Trade in the United States, and the representative and official organ of the Jewelers' League.

THE JEWELERS' CIRCULAR & HOROLOGICAL REVIEW, established 1869, is appreciated as the most complete and valuable periodical of its class published in any country. It reaches every branch of the jewelry, watch, clock, silverware and kindred trades throughout the United States, and is the only representative of the trade, which has secured, by its intrinsic merits and acknowledged benefits, a legitimate and *bona fide* patronage of paying subscribers, including many of the leading firms in England, France, Germany, Switzerland, Mexico, the West Indies, Brazil, the South American Republics, and other foreign countries.

The JEWELERS' CIRCULAR is regarded throughout this wide circle of interested and careful readers as a *reliable* authority and independent chronicle with regard to all matters connected with the trade, in its moral, mercantile and mechanical aspects, while its decided straightforward and consistent course of conduct in relation to commercial questions has won widespread approval.

To the practical workman the JEWELERS' CIRCULAR is invaluable as a text-book and work of reference. Its pages furnish him with the latest scientific and mechanical ideas, set forth in plain, comprehensible language by specialists of ability and experience. The technical information contained in its columns represents the progress of the age, and every intelligent workman in the country acknowledges the advantages resulting from a study of its pages.

To the country dealer the JEWELERS' CIRCULAR affords thorough, correct and perfect information as to staple and original articles of trade. From it he can learn what to order and where to obtain supplies, he can discover the best source of materials in common use, while the latest novelties are without exception first announced in its columns.

All communications to be addressed to D. H. HOPKINSON, 42 Nassau Street, N. Y.

Or the regular Agents of the CIRCULAR.

☞Parties visiting the Paris Exposition will find the CIRCULAR in the American, Swiss and English Exhibits, where full information will be given.

L. HAMMEL. LOUIS RUNKEL.

L. HAMMEL & CO.,

Importers of Watch Materials, Tools.

Watch Glasses, Silk Guards, Spectacles, Opera Glasses, Optical Goods, &c.

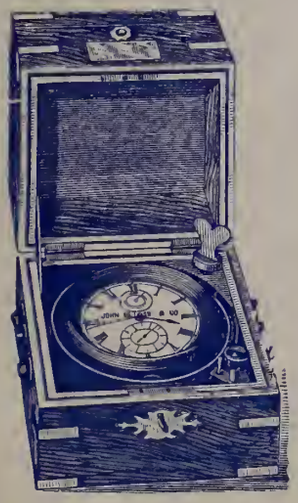
☞ Sole Agents in the United States for **G. B. Wheeler's Star Watch and Clock Oil,** and the Celebrated **Gravier Mainspring.**

☞ We would respectfully call the attention of the Trade to the celebrated **Star Spectacles and Eye Glasses,** of which we are the Sole Importers.

We would call the especial attention of the Trade to the celebrated PANTASCOPIC STAR SPECTACLES. they are the best made goods in this market! The frames of these Spectacles are light, finely tempered and highly finished, while the lenses are remarkable for their clearness, purity, and freedom from specks and flaws.

L. HAMMEL & CO., No. 9 Maiden Lane, New York.

☞ Send for Price List.



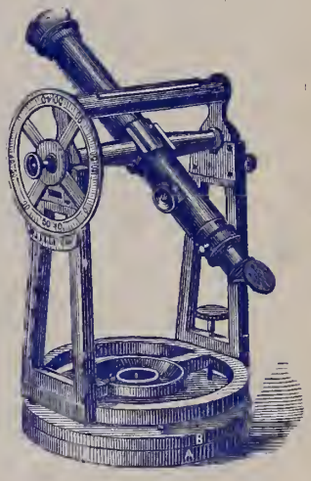
Standard Marine Chronometer
FOR KEEPING CORRECT TIME.

JOHN BLISS & CO.

STANDARD MARINE

Chronometers and Transits,

FOR WATCHMAKERS' USE.



No. 10

110 WALL STREET, NEW YORK.

IMPORTANT NOTICE.—These Transits are readily set in position without the aid of strictly correct time as a basis for that purpose. Printed instructions, easily understood, accompany each Instrument, and no calculations are required preliminary to setting in position.

As a trial only is required to insure unqualified approval, we are induced to make the following **LIBERAL OFFER**—On receipt by us of satisfactory reference, and 10 per cent. of the price, we will send one of the foregoing Transit Instruments, on hire or trial, for one month, with full printed instructions for setting up and using the same, and if purchased after trial, we will allow the whole hire to apply in part payment, and sell the Instrument on approved note at four months for the balance. Special terms for payment by installments, after trial, on application. We do not make this offer merely to hire these instruments, but to insure a trial with a view to sales, the hire received being only sufficient to cover the cost of repolishing in case they are returned. Send for Illustrated Circular giving full description.

JOHN BLISS & CO., 110 Wall Street, New York



TINGLEY, SINNOCK & SHERRILL,

MANUFACTURERS OF

FINE JEWELRY,

5 Maiden Lane, *Factory, Newark, New Jersey.*



P. HARTMANN,
JEWELER AND SILVERSMITH,
36 MAIDEN LANE,
NEW YORK.

HENRY MAY. **Established 1854.** JOSEPH STERN.

MAY & STERN,

IMPORTERS OF

Foreign Watches, Materials and Tools

AGENTS FOR THE SALE OF ALL

DOMESTIC MOVEMENTS AND CASES.

And MANUFACTURING JEWELERS

No. 20 John Street, New York.

☞ Will Remove May 1st to No. 19 John St.

☞ SOLID GOLD SEAL RINGS, in Cameo, Amethyst, Topaz and Onyx, A SPECIALTY.

L. LELONG & BROTHER,

GOLD & SILVER REFINERS,

Assayers and Sweep Smelters,

S. W. Cor. Halsey & Marshall Streets,

NEWARK, N. J.

SWEEPINGS A SPECIALTY.

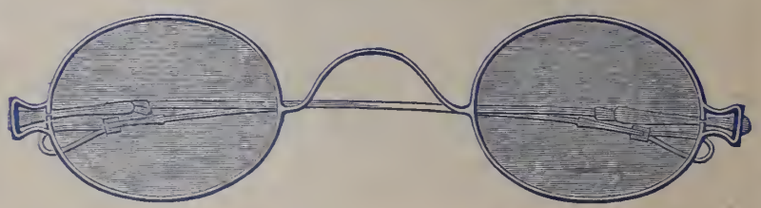
ALBERT LORSCH,

MANUFACTURER OF

PATENT ACCOMMODATING

Spectacles and Eye Glasses,

In Gold, Silver, Steel, &c.



Also Latest Novelties in Fine WATCHES & JEWELRY.

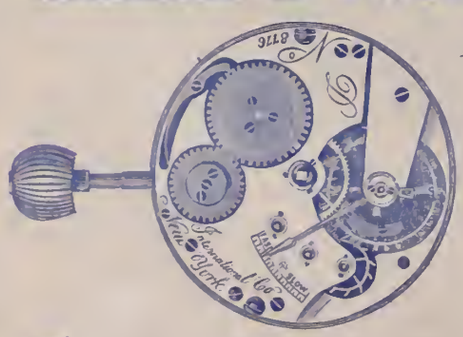
PRICES REDUCED TO SPECIE BASIS.

☞ I would call especial attention that with the above Spectacles and Eye Glasses it is only necessary to have one complete assortment of the different kinds of lenses, which being or uniform size, will interchange in all the different kinds of frames, thus giving a complete assortment for a comparatively small outlay

ALBERT LORSCH, 37 Maiden Lane, New York.

LORSCH BROS., 120 Sutter St., San Francisco, Cal.

KELLER & UNTERMEYER,



AUTHORIZED AGENTS
FOR THE SALE OF
THE

INTERNATIONAL

WATCH CO.'S

WATCHES.

☞ A full and complete assortment of these goods in new and attractive Cases constantly on hand.

No. 18 John Street, **New York.**

L. & M. KAHN,

Importers of

WATCHES

Sole Agents for
James Kahn.
E. Bourquin & Fils
AND
Alphonse Matile
WATCHES.

112 Kearny St.
San Francisco,
CALIFORNIA.

5 Rue des Alpes,
Geneva,
SWITZERLAND.

No. 10 Maiden Lane, New York.

Manufacturers of the EAGLE TIMER ! *the Best in the market.*

Volume. IX. No. 7.

AUGUST, 1878.



JEWELERS' CIRCULAR.

D. F. HOPKINSON, PUBLISHER.

42 NASSAU STREET, NEW YORK.

American Clock Co.

581 BROADWAY, NEW YORK.

REGULATOR No. 10.



No. 172 State Street, Chicago.
No. 7 Montgomery St., San Francisco.

SOLE AGENTS IN AMERICA FOR

E. N. Welch M'f'g Co. **New Haven Clock Co.**

Seth Thomas Clock Co. **Welch, Spring & Co.**

Seth Thomas, Sons & Co.

A. S. Hotchkiss' Tower Clocks,

(Made by the Seth Thomas Clock Co.)

A NEW SETH THOMAS

REGULATOR.

14 Inch Dial. Engraved and Silvered.

8 Day Time Weight. 68 Inches High. 21 Inches Wide. 9 Inches Deep.

The Seth Thomas Clocks are to be seen at the Paris Exposition, and are in care of Mr. Louis Ritz.

SETH THOMAS.

"NUTMEG" LEVER,
Front. Back.





30 Hour Nutmeg, Brass.
30 Hour Nutmeg, Nickel.

A Small Lever Time-piece

WINDS, SETS AND REGULATES

AT THE BACK.

HANGS UP OR STANDS UP.

WINDER ATTACHED TO CLOCK.

Scale, One-Quarter Size, 3 inch Dial.

"NUTMEG" ALARM LEVER.
Front. Back.





30 Hour Nutmeg Alarm, Brass.
30 Hour Nutmeg Alarm, Nickel.

AMERICAN CLOCK CO., (Hine & Thomas.)

Ansonia Clock Company,

MANUFACTURERS OF AMERICAN CLOCKS,

And IMPORTERS of CLOCKS of EVERY DESCRIPTION.

SALESROOMS: 19 & 21 CLIFF STREET, and 5 CORTLANDT STREET, (Near Broadway NEW YORK.

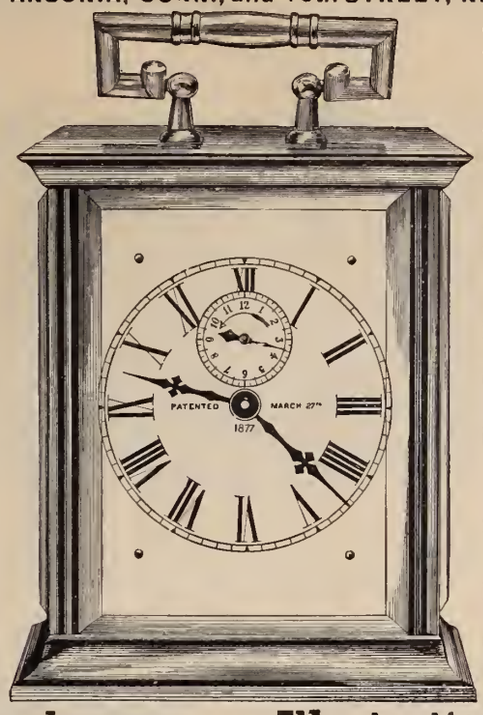
FACTORIES ANSONIA, CONN., and 10th STREET, NEW YORK.



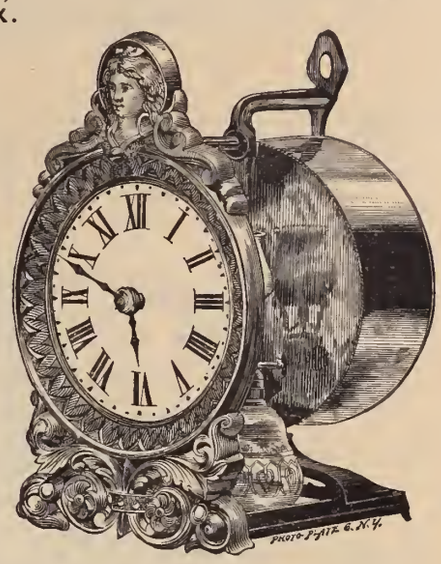
Peep O'Day Alarm.

One-half the size: Stem-Winding: Sets the alarm and winds at the back. "Only requires one spring" to be wound, and will go in any position.

CARRIAGE. STEM-WINDER. NICKEL OR GILT.



One Day Time, Alarm. No. 1, height, 5½ in. Eight Day Time. No. 2, height, 4½ in. Only one spring to wind. No. 3, height 3½ in.



Aladdin Night Light, Extra.

Nickel and Gilt. Stem-Winder. Patented November 1, 1877. One Day Time. Four inch dial. Height, 7 inches.

The above are excellent Time-keepers. Illustrations and prices on application.

A NEW LINE OF NOVELTIES WILL SHORTLY BE OFFERED.

Waterbury Clock Comp'y

Manufacturers and Jobbers of AMERICAN CLOCKS,

"Cricket." No. 4 Cortlandt St., New York. **"Sunrise."**

30 Hour Lever Time Piece. 30 Hour Lever Time Piece, Alarm

197 State Street,
CHICAGO.
113 Sansom Street,
SAN FRANCISCO.
Factories, - - Waterbury, Conn.

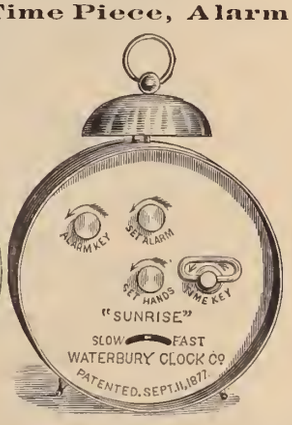
M. BAILEY, Treasurer.





ONE-THIRD ACTUAL SIZE.





ONE-THIRD ACTUAL SIZE.

"CRICKET" & "SUNRISE"

Are Stem-Winders, No Keys Required, Reliable Time-Keepers, Will Run in any Position, Separate Alarm Spring, Set and Regulate at the Back. Nickel-Plated Cases.

SOLE AGENTS FOR THE ITHACA CALENDAR CLOCK COMPANY.

Illustrated Catalogues and Price Lists furnished to the Trade upon application.

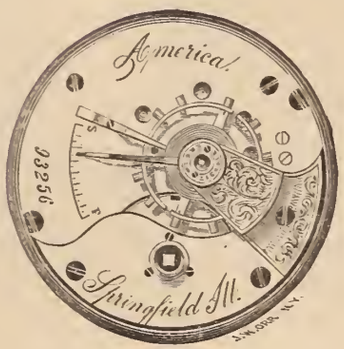
ILLINOIS

Springfield Watch Company,

MANUFACTURERS OF

KEY AND STEM-WINDING MOVEMENTS.

No. 1



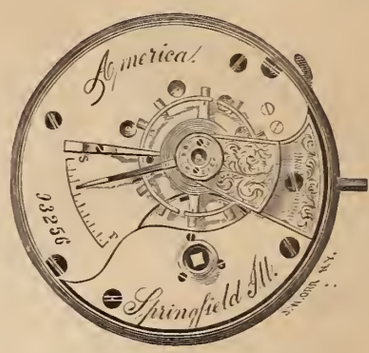
Key Wind, 7 Jewels.

18 SIZE,

FULL PLATE,

CUT

EXPANSION BALANCES.



No. 1

Key Wind, 7 Jewels.

No. 2



Stem Wind, 11 Jewels.



No. 2

Stem Wind, 11 Jewels.

The above new and desirable grades are now being delivered, and are furnished as above described, or without **grade** *trade marks, and in such case, being designated by the numbers 1 and 2, and engraved* **"Ills. Springfield Watch Co."**

"Interior," "America," and "Columbia" **Stem-Winders** *will be furnished with* **XII.** *at pendant and seconds opposite, for* **OPEN FACE** *Stem-Winding Cases. Any other grades on our list will be made* **on order** *in the same manner, in quantities of five or more of a grade—without extra charge.*

Improved **old English** *Dials have been added to the "***Bunn***" grade: handsome* **double sunk** *old English Dials, to the "***Stuart***" grade, making them especially attractive and desirable. This, the Trade will doubtless appreciate when taken in connection with their known time-keeping qualities.*

New price lists, having above additions, dated **August 1st,** *will be furnished by wholesale dealers, or the Company, upon application, enclosing business card.*

OFFICES.

11 MAIDEN LANE, NEW YORK. SPRINGFIELD, ILLS.



J. C. AIKIN, H. A. LAMBERT, J. B. SHEA.

AIKIN, LAMBERT & Co.,

MANUFACTURERS OF

Gold Pens, Pencil Cases, Holders, Pencils, Picks,



And RELIABLE JEWELRY in great variety.



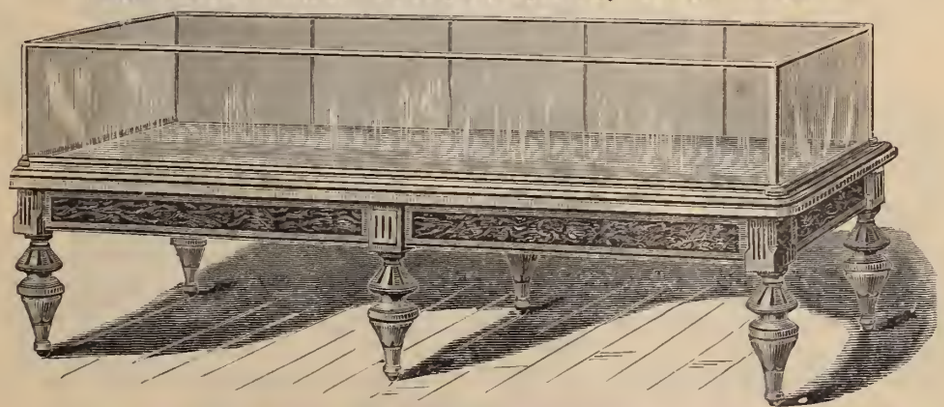
Our system of furnishing Show Case assortments, and establishing agencies, is broad, liberal and advantageous, and, as the originators of that method of display, now so popular with the Trade, we are offering liberal inducements to Agents. Prices recently reduced.

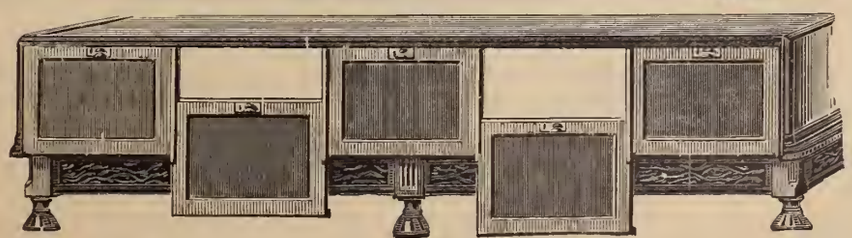
Illustrated Catalogues and Price Lists furnished upon application. Correspondence invited. Goods sent on approval when desired.

No. 23 MAIDEN LANE, NEW YORK.

PATENT IMPROVEMENT IN COUNTER SHOW CASES,

PERPENDICULAR SLIDING DOOR, DUST-TIGHT.





REAR VIEW OF CASE SHOWING SLIDING DOOR.

Its advantages are as follows:—The doors are more conveniently opened and closed, less liable to get out of repair or broken, articles are more easily reached in wide cases, mirrors are more safe, it dispenses with hinges, economizes room, excludes dust, and is air tight *when closed.*

☞Drawings furnished and estimates given for fitting stores in cabinet work complete.

REFERENCES:—Gorham Mf'g Co., Rogers & Bro., Mitchell, Vance & Co.
Meriden Britannia Co., M. S. Smith & Co., Detroit, Mich.
D. Valentine, Syracuse, N Y.

B. & W. B. SMITH,

220 West 29th Street, New York.

The Meriden Britannia Company,

UNION SQUARE, NEW YORK,

ARE MANUFACTURING AND HAVE ON EXHIBITION A CHOICE SELECTION OF DESIRABLE ARTICLES IN

FINE SILVER-PLATED WARE,

Combining every Modern Improvement in Plating and Elegance of Design, with Sterling Quality, and offer to the Trade the most Extensive and Attractive Assortment ever presented in this country. Also, a Large Variety of ORNAMENTAL ARTICLES, suitable for Presents. Our Assortment consists in part of

Spoons, Forks, Table Cutlery, Dinner, Tea and Dessert Sets, Entre Dishes, Epergnes, Castors, Cake Baskets, Ice-Water Sets, Tea and Coffee Urns, Salvers, Communion Ware, &c.

Centennial Medals and Diplomas were Awarded to this Company for "Superior" Silver-Plated Ware.

Extract from Centennial Judges' Report.—"Their large variety of Silver-Plated White Metal Hollow Ware is of excellent quality and finish, and of tasteful designs." "Their Silver-Plated Forks, Spoons and Knives are of superior quality and excellent finish. Their XII Plating, or extra plating on exposed parts, deserves commendation."

Extract from American Institute Report.—"Their Porcelain-Lined, Double-Walled Ice Pitchers are **A 1**, and possess ALL the qualities the company claim." "We consider the goods made by this company to be by far THE BEST made in this country, and we believe in the world."



THE PORCELAIN-LINED ICE-PITCHERS, ANOTHER SPECIALTY.—Valued for retaining the Purity and Coolness of Water, as well as for Durability, Cleanliness and Chemical Excellence of their Interior Surface. The Porcelain is Enameled on Hard Metal and cannot be broken or cracked by rough usage.

"There are many apparent advantages in these linings, besides those already mentioned, BUT THE ABSENCE OF ANY INJURIOUS MATERIAL in the construction of this inner chamber SHOULD BE THE FIRST CONSIDERATION IN SELECTING A SAFE ICE PITCHER FOR DAILY USE."—S. DANA HAYES, M. D., State Assayer of Massachusetts.

We take much pleasure in referring to the reputation we have for many years maintained for manufacturing SPOONS AND FORKS BEARING THE TRADE MARK, "1847, ROGERS BROS."

Particular attention is invited to our Patented Process of Electro-Plating Spoons and Forks, by which the parts most exposed to wear receive an EXTRA COAT OF SILVER. This feature renders these goods more economical and durable than those of any other manufacture, while the increased cost is relatively small. This method of plating we apply to the 4, 8 and 12 oz. plate, as required.

☞ **First Premiums** Awarded at all Fairs where Exhibited, from the World's Fair, 1853, to American Institute Fairs, 1873, 1874 and 1875, inclusive, and at the Philadelphia Centennial Exhibition, 1876.

Manufactories, West Meriden, Conn. **WAREROOMS, UNION SQUARE, NEW YORK.**

SUPERIOR ELECTRO-PLATE!

MANUFACTURED BY

THE MIDDLETOWN PLATE COMP'Y,

Factories, MIDDLETOWN, Conn.

Salesrooms, { 13 John Street, New York.
120 Sutter Street, San Francisco.

SUPERIOR HARD WHITE METAL,

SUPERIOR HEAVY PLATE,

SUPERIOR DESIGNS, WORKS OF ART

Wedding and Fancy Presentation Pieces in Elegant Designs.

Our assortment of Tea Sets, Urns, Butter Dishes, Syrup Cups, Baskets, Pitchers, Waiters, Goblets, Fruit and Berry Dishes is complete in **new designs.**

Our Patterns are Original! **Photographs sent dealers on application!**

SIMPSON, HALL, MILLER & CO.

Fine Electro-Silver Plated Ware,

Factories, Wallingford, Conn. Salesroom, No. 676 Broadway N. Y.

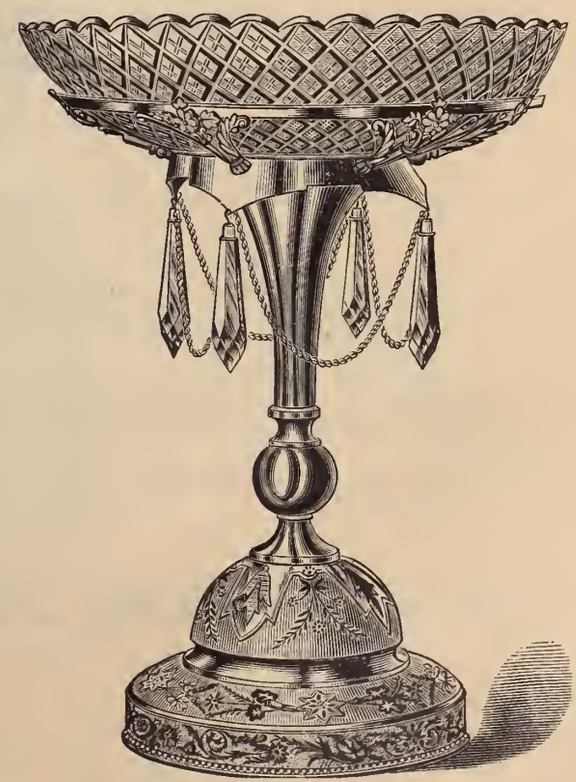
One of the oldest and most reliable manufactories in the country.

Our Solid Table Ware is made of the Best Nickel Silver.

Spoons, Forks, Ladles, Pie Knives, &c.

IN GREAT VARIETY OF PATTERNS.

Solid Steel Knives, superior article and Heavily Plated for Service.



OUR HOLLOW WARE consists of Tea Sets, Urns, Tea Trays, Spoon Holders, Milk and Water Pitchers, Butter Dishes with glass plates, Cake Baskets, Biscuit Bowls, Berry Dishes, Fruit Stands, Pickle and Jelly Dishes, Dinner and Breakfast Castors, Oyster and Soup Tureens, Baking Dishes, Steak Dishes, Vegetable Dishes, Celery and Salad Dishes, Syrup Cups, Tray and Rack for holding Spoons and Forks, also with Call Bell attached (patented). Toilet Sets in great variety of patterns, beautiful glass, richly mounted with silver, Vases, Card Stands combined. The glass Vases are of various patterns and styles; cut and fancy, of the most beautiful designs and mounted in the most elegant silver frames and stands. Centre Pieces and Epergnes, the most elaborate or plain, as desired; in fact thousands of articles in the line of Silverware, and all warranted to be first-class and exactly as represented.

☞ Our facilities being second to none to produce the finest and most serviceable *ELECTRO-PLATED WARE*, at the lowest possible price. By years of experience, close attention to business, and our unsurpassed facilities, we are enabled to produce goods as cheap, if not cheaper, than any other concern in this country, consequently dealers can feel assured that they will always get goods from us at the very lowest price. The pride of our house is to make the finest goods, and sell them at fair prices, and please our customers, by honorable dealings, and retain the reputation which, we believe, is unquestioned as to our making the best of goods and also the cheapest.

PATENT BUTTER DISH.

We have introduced this season an entirely new and novel Butter Dish. The convenience of its opening and closing can but strike one favorably. Its beauty of design and workmanship must please everybody. We have produced other valuable designs and patents in the way of Butter Dishes as well as many other useful articles in our line, but this is the most complete and perfect in its arrangement of anything heretofore produced, and must take the lead of all other first-class Butter Dishes in the market.

DAVID F. CONOVER & CO.,

(Successors to Wm. B. Warne & Co.)

Importers, Manufacturers and Wholesale Dealers in

WATCHES AND JEWELRY.

Silver and Silver-Plated Ware,

American Watch Wholesale Salesroom,

Southeast Corner Chestnut and 7th Sts.,

(FIRST FLOOR.)

David F. Conover,
B. Frank Williams,
C. Edgar Righter.

PHILADELPHIA, PA.

LOUIS STRASBURGER & CO.,

Importers and Makers of Watches,

OF EVERY DESCRIPTION,

From the Finest Stem-Winding and Setting Goods to the Lowest Priced Watch in the Market.

Our Stock is unusually complete and attractive and embraces an assortment of the best Commercial Watches to be found anywhere ranging from $4.00 to $600 each.

We would also call the attention of buyers to our select display of fine Timing and Complicated Watches, Chronographs and Repeaters, of every description, from the establishments of the most eminent makers.

☞ We are also the Sole Agents for the International Watch Co.'s Watch, so well and favorably known in this market.

LOUIS STRASBURGER & CO.,

No. 15 Maiden Lane, New York.

Diamond Bureau,
No. 30 Boulevard Houseman,
PARIS

Watch Factory,
Chaux de Fonds, Switzerland.

GORHAM M'FG. CO.

SILVERSMITHS.

Factories, Providence, R. I.

SALESROOMS,

37 UNION SQUARE, N. Y.

Branch Office, 120 Sutter Street, San Francisco.

Sterling Silverware and the Gorham Plate.

HOLLOW-WARE.—Our manufactures in this important branch are of the widest range, covering all the wants for household use and decoration. Prize and Presentation Sets and pieces for general and specific purposes.

SPOON-WARE.—Complete illustrated sheets of our SPOON AND FORK PATTERNS, with price list, will be furnished to the trade upon application. The Hindostan which has been added to our list the present season has been most favorably received. Its style of ornamentation is, as its name indicates, Indian or Hindostan, equal to the Raphael in beauty of design, smooth to the touch, free from the objectionable feature of sharp edges, and by a judicious distribution of metal the very desirable feature of strength in the shank is obtained, giving the appearance of a much heavier spoon.

FLAT-WARE.—The variety of combinations, suitable for wedding and holiday gifts, range from a single article of trifling value to elaborate combinations of several hundred pieces. New styles of decoration in color has been an attractive feature in the productions of the present season.

CASES.—Elegant and desirable Cases for these varied combinations are of our own manufacture, including Plate Chests substantially made in plain and ornamental wood.

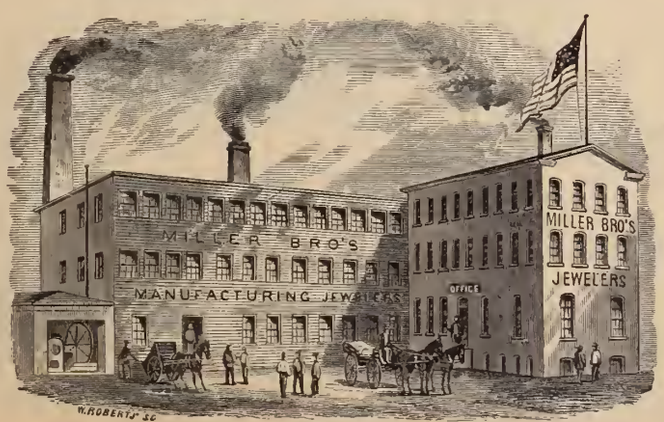
MILLER BRO'S,

MANUFACTURING JEWELERS,

No. 11 MAIDEN LANE, NEW YORK.

Manufactory, 47, 49 & 51 Franklin Street, Newark, N. J.

INITIAL GOODS



A SPECIALTY!

Seals, Lockets, Sets, Sleeve Buttons, Studs, Collar and Chemise Buttons.

ATTENTION IS INVITED TO OUR

NEW STYLES OF ETRUSCAN SLEEVE BUTTONS.

MOUNTED WITH

RUSTIC LETTERS,

BIRDS, ANIMAL HEADS AND FANCY ORNAMENTATIONS

HODENPYL, TUNISON & CO.,

MANUFACTURERS OF

Fine Gold Chain and Jewelry.

A FULL ASSORTMENT OF

ROMAN BAND BRACELETS,
ROMAN NECK CHAINS AND PENDANTS,
LOCKETS, SLEEVE BUTTONS,
STUDS, AND CHAIN MOUNTINGS.

OUR STYLES ARE VARIED, NEW AND NOVEL.

Salesrooms, No. 170 Broadway, New York.

☞Desirable goods for the Export Trade.

CLEMENS OSKAMP,

Manufacturing Jeweler,

And SILVERSMITH,

IMPORTER & WHOLESALE DEALER IN WATCHES,

CLOCKS, MATERIALS & OPTICAL GOODS.

175 Vine Street, CINCINNATI.



TINGLEY, SINNOCK & SHERRILL,

MANUFACTURERS OF

FINE JEWELRY.

5 MAIDEN LANE, *FACTORY, NEWARK, NEW JERSEY.*

J. B. & S. M. KNOWLES,

MANUFACTURERS OF

Sterling Silverware

Office, No. 20 MAIDEN LANE,

NEW YORK.

Factory, No. 93 PINE STREET, PROVIDENCE, R. I.

ESTABLISHED 1859.

RINGS A SPECIALTY.

BRYANT & BENTLEY,

No. 12 Maiden Lane, New York.

MANUFACTURE A LARGE VARIETY OF

FINE SOLID RINGS,

For Ladies and Gentlemen, in CAMEO, AMETHYST, ONYX, TOPAZ, TURQUOISE, GARNET and other stones, Fine CAMEO, CORAL and ROMAN SETS of new and handsome designs. LOCKETS, MEDALLIONS, SHAWL and SCARF PINS, SLEEVE BUTTONS, STUDS, &c. All goods warranted.

☞We continue to manufacture several hundred patterns of **HARD SOLDER RINGS**, in every style, for men, women and children, stamped and warranted 16 carat fine.

BUCKENHAM, COLE & SAUNDERS,

SUCCESSORS TO

BUCKENHAM, COLE & HALL,

IMPORTERS OF

Diamonds, Pearls

AND OTHER PRECIOUS STONES,

MANUFACTURERS OF FINE JEWELRY,

10 Maiden Lane, New York.

☞A large stock of FINE DIAMONDS, Mounted and Unmounted kept constantly on hand. Goods sent on approval to any part of the country on receipt of satisfactory references.

ESTABLISHED 1837.

VICTOR BISHOP & CO.

IMPORTERS OF

Diamonds, Precious Stones, Mosaics, Cameos

CORAL JEWELRY,

Imitation Stones, *Roman Pearls.*

FINE FRENCH BEADS,

Of all Colors, in Strings and Necklaces.

Diamond Scales, Gold Shells, Silver and Copper Foil, &c.

Enamel of all colors and quality; also Platinum and Copper.

No. 47 NASSAU STREET, NEW YORK.

House in Paris, 66 Boulevard de Sebastopol.

☞ **The Patent 12 o'clock Stem-Winders and Stem-Setters, with Seconds Hand; made to Wind at Figure XII. instead of at Figure III.**

☞ We have also on hand the **Arburndale Horse Timers,** for which we solicit orders



☞ We desire to call the special attention of Watch Dealers and Jobbers to the fact that we have made arrangements with the patentee for the manufacture and exclusive sale of his **Patent Open Face, Full Plate, Stem Wind Attachments,** indicated in the annexed design.

☞ These Stem Wind, and Hand Set Attachments can be applied to the regular 18 size Key Winding Movements, made by the WALTHAM, ELGIN and SPRINGFIELD WATCH COMPANIES, and warranted by us to be both accurate and reliable.

The great increase in the demand for American **Open Face** Watches in the past few years, renders this a very desirable improvement. ☞ When requested we will send samples of these Watches for examination and approval.

J. T. SCOTT & CO., No. 11 Maiden Lane, New York.

Jobbers, Manufacturers & Importers of Watches, Jewelry, Chains, Diamonds, &c.

SAXTON, SMITH & CO.

MANUFACTURERS OF

Fine Gold Chain.

No. 194 BROADWAY

New York.

Factory, No. 183 Eddy Street, Providence, R. I.

☞ **Sole Agents for the new PATENTED CHAIN BAR, containing a Detachable Pencil.**

WOOD & HUGHES,

STERLING

Silverware Manufacturers

No. 16 JOHN STREET,

NEW YORK.

HELLER & BARDEL,

MANUFACTURERS OF

DIAMOND JEWELRY,

And Dealers in Diamonds,

No. 13 John Street, New York.

☞ A full line of DIAMONDS, mounted and unmounted; also, a large assortment of first-class DIAMOND MOUNTINGS of our own make always on hand. We will send goods on selection to responsible houses.

Geo. Krementz. J. A. Lebkuecher.

KREMENTZ & CO.,

Manufacturing Jewelers,

No. 13 John Street,

Factory, 361 MULBERRY ST., Newark, N. J.

NEW YORK.

WHITING M'F'G COMPANY,

SILVERSMITHS.

TRADE  MARK.

STERLING

WORKS & WAREROOMS,

Broadway & Fourth St., New York.

WHOLESALE ONLY.

DISSOLUTION.

The copartnership heretofore existing between the undersigned, under the firm name of SMITH, HEDGES & CO., is this day dissolved by mutual consent. Any of the partners will sign in liquidation.

ALFRED H. SMITH,
WILLIAM S. HEDGES,
JAMES HEDGES,
HARRISON B. SMITH.

No. 1 MAIDEN LANE, NEW YORK,
JULY 13th, 1878.

The undersigned have this day formed a copartnership, under the firm name of ALFRED H. SMITH & CO., *and continuing business as Importers of Diamonds, have removed to No.* 14 *John Street.*

ALFRED H. SMITH.
HARRISON B. SMITH.

New York, July 15*th*, 1878.

The undersigned have this day formed a copartnership, under the firm name of WM. S. HEDGES & CO., *and continuing business as Importers of Diamonds, have removed to No.* 170 *Broadway, corner of Maiden Lane.*

WM. S. HEDGES.
JAMES HEDGES.

New York, July 15*th*, 1878.

CARTER, HOWKINS & SLOAN,

Makers of Fine Jewelry

Consisting of Chains, Bracelets, Sets, Pins, Studs, Sleeve Buttons, Rings, &c., in Roman, Etruscan and Enamel.

Whiting Building, Corner Broadway and Fourth Street,

A. CARTER JR.
WM. HOWKINS,
A. K. SLOAN.

NEW YORK.

C. E. HASTINGS,
GEO. R. HOWE.
W. T. CARTER.

Established 1817.

Ve. J. MAGNIN, GUÉDIN & CO.

Manufacturers and Importers,

FINE SWISS WATCHES,
REPEATERS, CHRONOGRAPHS & CALENDARS.
GENEVA GOLD JEWELRY,
FRENCH CLOCKS AND BRONZES,
RICH FANCY GOODS,
HORSE-TIMERS & PODOMETERS,
GOLD AND SILVER CHATELAINE WATCHES.

No. 652 BROADWAY, NEW YORK.

Sole Agents for the James Nardin Watch.
House in Geneva, 14 *Grand Quai.*

HALE & MULFORD,

MANUFACTURERS OF

RICH JEWELRY,

(WHITING BUILDING,

No. 694 Broadway, corner 4th Street,

NEW YORK.

Stone and Stone Cameo Goods, Rings, Necklaces, Colored and Etruscan Work, Etc.

FIRST-CLASS GOODS OF OUR OWN MAKE
EXCLUSIVELY!

BALDWIN, SEXTON & PETERSON

MANUFACTURERS OF

Fine Jewelry,

Diamond and Stone Cameo Goods,

GOLD CHAINS, &c.

Importers of Diamonds, Pearls, Emeralds, Rubies, &c.

WHITING BUILDING,

Cor. Broadway and Fourth Street,

NEW YORK.

ALFRED H. SMITH & CO.

OF THE LATE FIRM OF SMITH, HEDGES & CO.

IMPORTERS OF

DIAMONDS

No. 14 JOHN STREET.

NEW YORK

WHEELER, PARSONS & HAYES,

MANUFACTURERS OF

Watch Cases, Gold Chains & Fine Jewelry,

AND DEALERS IN

AMERICAN AND SWISS WATCHES,

NO. 2 MAIDEN LANE, NEW YORK.

Joseph B. Bowden & Co.

MANUFACTURING JEWELERS,

SOLID GOLD RINGS

A SPECIALTY.

A LARGE ASSORTMENT OF PLAIN, CARVED, PLAIN BAND AND CHILDRENS' ALWAYS ON HAND. ALSO A FULL LINE OF CAMEO SLEEVE BUTTONS AND STONE RINGS.

Old No. 11 Maiden Lane, New York.

ONYX GOODS A SPECIALTY!

JOHN A. RILEY & CO.,

Manufacturing Jewelers,

ETRUSCAN GOLD AND CORAL SETS, ROMAN BRACELETS, NECKLACES, &C.

Nos. 7 and 9 BOND STREET

NEW YORK.

No. 126 Kearny Street, San Francisco, Cal.

Established 1813.

THOMAS G. BROWN,

MANUFACTURER OF

FINE JEWELRY,

NEWARK, N. J.

—AND—

9 BOND STREET, NEW YORK.

MOORE & HORTON,

JEWELERS,

No. 11 Maiden Lane, New York.

SPECIALTIES!

Stone Cameo, Onyx, Amethyst, Topaz and Pearl Rings. Studs, Collar and Sleeve Buttons.

☞ Also our new fac-simile of Fine African Diamonds, mounted in Rings, Studs, Pins, Ear-rings, Scarf Pins, Medallions.

W. H. SHEAFER & CO.,

Makers of Fine Jewelry

CONSISTING OF

BRACELETS, SETTS, LOCKETS, PINS,

STUDS, SLEEVE BUTTONS, RINGS, &c.

SPECIALTY:—STIFFENED ROMAN BANDS.

No. 908 Chestnut Street, PHILADELPHIA.

NOAH MITCHELL,

MANUFACTURER OF

Fine Gold Jewelry

CAMEO SETS, ONYX GOODS,

Medallions, Studs, Sleeve Buttons, Rings and Diamond Settings of all Kinds.

DIAMOND SETTING A SPECIALTY.

694 & 696 Broadway, cor 4th St., New York

(WHITING SILVER MF'G CO.'S BUILDING.)

ALL ORDERS PROMPTLY ATTENDED TO.

Ripley, Howland & Co.



MAKERS OF

FINE JEWELRY.



Would respectfully call attention to their patent PLATINUM TIPPED Settings for Diamonds (just introduced), an advantage dealers will readily appreciate, as the stone is held, not by yellow, but by scarcely perceptible *white* points which are equally strong and more durable than gold.

These *white* points impart an elegant appearance to the gem and relieve the setting of that coarse and unattractive look usually found in those entirely composed of silver or platinum.

PATENTED APRIL 16th, 1878.

NO. 35 MAIDEN LANE, NEW YORK.

FACTORY, 383 WASHINGTON STREET, BOSTON, MASS.

AMASA BRAINERD, JOHN W. STEELE, DYER BRAINERD.

BRAINERD, STEELE & CO.,



MANUFACTURERS OF

Brainerd's Pat. Lockets,

(Patented June 17, 1874.)



These Lockets combine both beauty and strength. They are made of solid 14kt. gold, and the stones used are the finest obtainable in the market. They cost no more than those of the old style, if indeed as much; and the combination of secrecy and durability renders them much more desirable. We make three sizes in four different shapes—round, oval, cushion and oblong square; and also Sleeve Buttons of the same style, containing a concealed box for miniatures, a novelty new to the Trade.

FINE GOLD JEWELRY,

No. 9 Maiden Lane,

NEW YORK.

E. HOWARD & CO.,

MANUFACTURERS OF

Fine Watches, Regulators, Office Clocks,

Electric Watch Clocks & Tower Clocks,

Office, No. 694 BROADWAY,

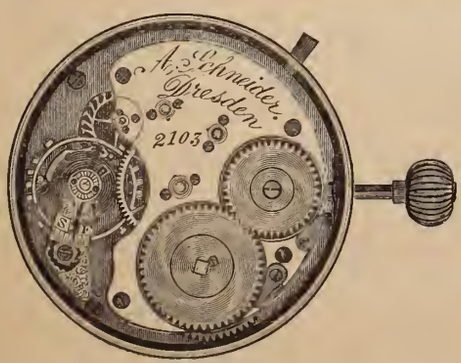
Corner Fourth Street, NEW YORK.

No. 114 TREMONT STREET, BOSTON.

J. W. J. PIERSON, - - AGENT.

MAX FREUND & CO.

Manufacturing Jewelers.



IMPORTERS OF

Watches

Jewelry and Precious Stones,

8 Maiden Lane,

NEW YORK.

☞Sole Agents for the Celebrated A. Schneider Watch, Dresden.

Dorrance, Edge & Co.

MANUFACTURERS OF

THE CELEBRATED WOVEN FABRIC

GOLD CHAIN.

Elegantly Mounted Bracelets, Opera, Leontine,

VICTORIA WATCH GUARDS & NECKLACES, in all the Newest Designs.

☞Our stock is unusually complete, and, in addition to the above, a variety of Necklaces, from 1½ to 40 dwt. each, to which we invite the attention of buyers.

No. 9 John Street, New York.

Factory, 46 Greene Street, Newark, N. J.

ENOS RICHARDSON & CO.

MANUFACTURERS OF

FINE GOLD JEWELRY,

Gold Chains, Lockets, Crosses and Necklaces,

COLORED AND ETRUSCAN WORK.

All Goods sold strictly of our own manufacture.

23 MAIDEN LANE, NEW YORK.

ENOS RICHARDSON, L. P. BROWN, F. H. RICHARDSON,
THOS. SLATER, W. P. MELCHER.

Established 1846.

WILLIAM RIKER,

No. 5 Maiden Lane, New York.

Factory, 42 Court Street, Newark N. J.

CHATELLIER & SPENCE,

Manufacturing Jewelers,

652 BROADWAY, NEW YORK.

No. 1129 Chestnut Street, PHILADELPHIA, PA.

No. 12 West Street, BOSTON, MASS.

No. 120 Sutter Street, SAN FRANCISCO, CAL.

CHATTERTON & DODD,

Makers of Fine Jewelry

Consisting of Sets, Pins, Ear-Rings, Lockets, Crosses, Sleeve Buttons, Studs, &c.

No. 19 John Street, New York.

ROMAN, ETRUSCAN AND ENAMEL WORK GENERALLY, SPECIALLY DESIGNED BY US.



Diamonds loose and mounted sent on approval on receipt of satisfactory reference.

COE, PINNEO & STEVENS,

MANUFACTURERS OF

LOCKETS,

WHITE ENAMEL STUDS & BUTTONS,

Linen Finished and

FINE JEWELRY,

Old No. 9 Maiden Lane, New York.

J. A. BROWN & CO.

OFFICE AND SALEROOM: No. 11 Maiden Lane, N. Y.
FACTORY: No. 104 Eddy St., Providence. R. I.

SOLE MANUFACTURERS OF THE

Ladd Patent Stiffened Gold Watch Cases



For the Movements of the various American Watch Co.'s, Gent's, Ladies' and Boys' sizes, Key and Stem-Winders, and in the following styles, BASCINE, FLAT-BEVEL, and MANSARD, (this latter as originally named, modeled and introduced by them) forming the most complete and varied line of elegant Cases ever offered for sale. It is now eleven years since these Watch Cases were introduced to the public, during which period of time they have steadily gained in popular confidence and esteem, as is evinced by the unprecedented fact in the history of the Watch Trade that more than FIFTY THOUSAND of them have been manufactured and sold. Made of thick plates of Gold and Nickel Composition, (this Composition is harder and tougher than any other metal except the gold itself, and suggested the term STIFFENED, originally used by us to designate this important improvement; no other case in the world is made like it;) thoroughly welded together and rolled to the required thickness—they are, while equally handsome—stronger and more durable than the finest Solid Gold Cases of the same thickness of metal, and at ONE-THIRD or ONE-HALF the COST, and with good movements, they make the cheapest, most elegant and serviceable Watches in the market. The critical examination of these goods by the trade and public is invited. **FOR SALE BY JEWELERS GENERALLY.**

☞Dealers can obtain them of the Wholesale Watch and Jewelry Houses, or their Traveling Agents, throughout the United States and British Provinces.

☞All genuine Watch Cases of our manufacture, have "G. W. Ladd's Patent, June 11th, 1867," stamped upon the side band underneath the glass bezel.

Refuse all others. Send for full Descriptive Circular.

CHARLES GLATZ,

MANUFACTURER OF

Gold and Silver Watch Cases

No. 41 Maiden Lane,

NEW YORK.

NATHAN E. MORGAN. CHAS. B. HEADLY.

MORGAN & HEADLY,

MANUFACTURERS OF

GOLD SPECTACLES,

FINE JEWELRY, CHAINS, BRACELETS,

18 Karat Plain Rings, &c.

Artisan Hall, 611 & 613 Sansom Street,

PHILADELPHIA.

☞A full line of *DIAMONDS,* mounted and unmounted, always on hand, which we will send on approval to the Trade, on receipt of reference.

MATHEZ
Watch Company,
Of NEW YORK.

Gents' and Ladies' Stem-Winding Movements

STRAIGHT LINE, 3-4 PLATE NICKEL.

These Movements are of six different grades, uniform in size and beautifully finished, and will be SOLD AT LOWER PRICES than any other goods of similar excellence.

☞A FULL LINE of materials for our movements always kept in stock for the convenience of those using our goods.

F. H. MATHEZ, Sole Agent,

No. 5 Maiden Lane, New York.

LOUIS A. SCHERR. CHAS. H. O'BRYON. G. W. SCHERR.

LOUIS A. SCHERR & CO.

Importers and Wholesale Dealers in

Watches, Jewelry,

WATCH MATERIALS, TOOLS, GLASSES, &C.

Spectacles, Silk Guards, &c.

Wholesale Agents for American Watches.

No. 726 CHESTNUT STREET,

FIRST FLOOR,

PHILADELPHIA.

T. GRANBERY,



Manufacturer of

BLACK ONYX



GOODS.

Patented July 16th, 1878.

This Locket is made with double glasses, in numerous shapes and sizes, shows less gold, and is lower priced than any other onyx locket manufactured.

☞ Is especially designed for Ladies' and Gents' Mourning Wear.

☞ Coral Repairing for the Trade.

51 Nassau Street, New York.

GAS FIXTURES.

ARCHER & PANCOAST M'F'G CO.,

No. 67 Greene Street,

Nos. 68, 70 and 72 Wooster Street,

NEW YORK.

WM. J. SUTTIE,

MANUFACTURER OF

Spectacles & Eye Glasses



In Gold, Silver, Steel and Shell

Jobber in Spectacles & Eye Glasses,

Cylindrical, Prismatic & Combination Glasses a specialty.

REPAIRING FOR THE TRADE.

No. 39 Maiden Lane, New York.

BOREL & COURVOISIER TO THE FRONT!

SWISS WATCHES

AGAIN RANK AS THE BEST.

IMPROVED MACHINERY HAS DONE THE WORK.

☞We are happy to inform our agents and patrons that the new B & C. are now ready. ALL ORDERS CAN BE FILLED AT ONCE! We are authorized to make a considerable reduction from former prices, in order to place them within the reach of all.

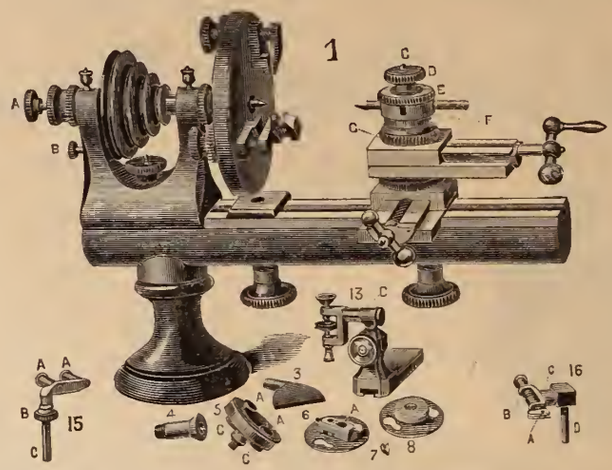
☞Dealers wishing to act as authorized agents for the sale of these celebrated Watches and Movements will be furnished with full particulars by addressing, with business card,

QUINCHE & KRUGLER,

No. 17 MAIDEN LANE, NEW YORK.

Sole Agents in the United States.

HOPKINS' WATCH TOOL CO.



Manufacturers of HOPKINS' PATENT WATCHMAKERS' TOOLS, embracing Plain and Combination Lathes, Chucks, Slide and Swing Rests, Gear Cutters, Pivot Polishers, Jeweling and Staking Tools, &c.

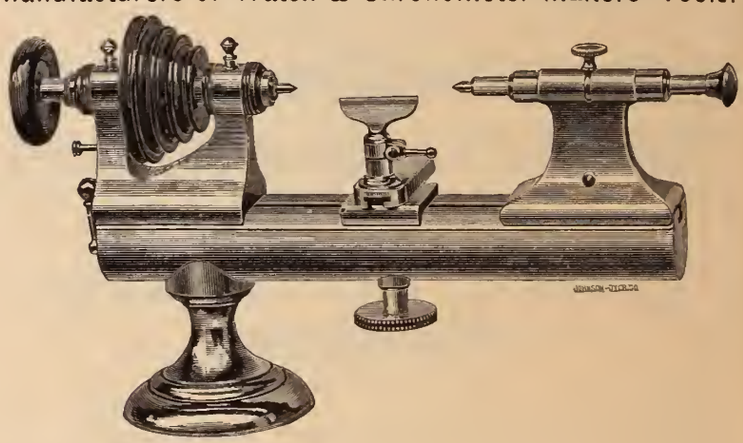
Illustrated circulars sent on application.

HOPKINS' WATCH TOOL CO., Waltham, Mass.

American Watch Tool Co.

Formerly J. E. WHITCOMB & Co.

Manufacturers of Watch & Chronometer Makers' Tools.



P. O. Box 999. WALTHAM, MASS

KOCH SONS & CO.,

MANUFACTURERS OF

Adjustable Leaves for Photograph Mounts

☞Specially adapted for showing Photograph Examples of Wares, arranged to bind in connection with our p tent binder.



Every leaf is so arranged that it can be inserted or detached without disturbing the rest. ☞ Binders adjusted to the JEWELERS' CIRCULAR, capable of holding one year's edition.

Full cloth, and embossed in gilt,..... $1.25
Leather back and corners, cloth sides..... 1.50

No. 156 William Street, New York.

MANUFACTURERS OF EXCLUSIVELY

BLACK ONYX GOODS,

WOGLOM & MILLER,
32 & 34 JOHN STREET,
NEW YORK.

Wm. C. Greene & Co.

GOLDSMITHS

MANUFACTURERS of RICH SETS IN TAPER WIRE CORAL

Sleeve Buttons, Studs, Crosses, Ear Drops, &c.
Brooches, Enamel Sets, Engraved, Coral Cameo, Amethyst Stone Cameo

Factory
95 Pine St.
Providence, R. I.

NEW YORK OFFICE, No. 192 BROADWAY.

WM. C. GREENE. B. W. GREENE. GEO. D. BRIGGS.

BOOZ & THOMAS,

MANUFACTURERS OF

Watch Cases & Jewelry,

TRADE MARK

108 SOUTH EIGHTH STREET,

Second Story, **PHILADELPHIA.**

Illustrated Catalogues sent upon application.

Old Gold & Silver Bought or Exchanged.

PARTICULAR ATTENTION PAID TO REPAIRING.

TELL A. BEGUELIN,

(Successor to the late GINNEL & BRO.)

Importer of Watches

WATCH MATERIALS, TOOLS AND GLASSES,

No. 71 NASSAU STREET,

(UP STAIRS),

CORNER JOHN STREET **NEW YORK.**

Sole Importer of the TELL A. BEGUELIN'S BEST MAINSPRINGS.

☞Every description of Watches carefully repaired for the Trade.

H. Muhr's Sons, Philadelphia.

MANUFACTURING JEWELERS,

Solid Gold Finger Rings of Every Description.



Crown, 18k. Lion.



On and after January 1st, 1876, our make of Filled Plain Rings will be stamped as above, which stamp is copy righted. Any and every infringement on the above Trade Mark will be dealt with according to law. ☞Every one warranted.

THESE GOODS ARE SOLD BY ALL THE LEADING JOBBERS!

Should the house that any retailer deals with not have them we will furnish them with the address of the nearest Jobber. ☞SELL TO THE JOBBING TRADE ONLY!

New York Office, 11 Maiden Lane.

☞Address all communications to Philadelphia.

HAMILTONS & HUNT,

MANUFACTURERS OF

Fine Plated Chains

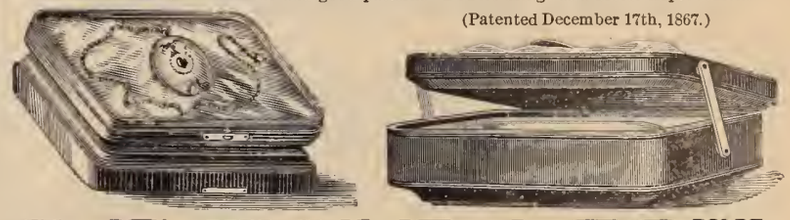
AND PATENT BUCKLE BRACELETS,

Branch Office, 176 Broadway, New York

FACTORY, 226 EDDY STREET, PROVIDENCE, R. I.

ESTABLISHED 1854. ☞Medal and Diploma Awarded at Centennial Exhibition.
JUDGES' REPORT:—Well made and good patterns—Double Hinge as a useful improvement

(Patented December 17th, 1867.)



G. F. KOLB & SON,

MANUFACTURERS OF FINE

Morocco, Velvet and Cabinet Cases,

FOR JEWELRY, WATCHES & SILVERWARE.

TRAYS FOR SHOW CASES, TRUNKS, &C.

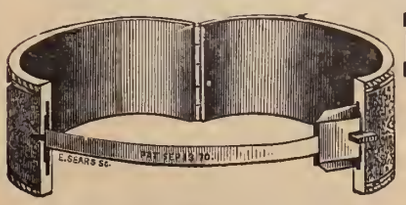
732 Sansom Street, PHILADELPHIA.

Established 1845.

WILLIAM H. BALL,

SUCCESSOR TO

BALL & BARNARD,



Manufacturing Jeweler,

Fine Gold, Enameled and Colored

BRACELETS,

A SPECIALTY!

☞All my Bracelets have the PATENT GUARD at no additional expense, Thus saving the price of chains.

No. 9 JOHN STREET, NEW YORK.

Factory, 30 & 32 Franklin Street, Newark, N. J.

Dealers in Watches,

Importers of Diamonds.

OPPENHEIMER, BROS. & VEITH,

Manufacturing Jewelers,

35 MAIDEN LANE,

S. Oppenheimer, A. Oppenheimer, **New York.** Henry F. Veith. Gus. F. Veith,

Goldsmith & Schliesser,

Manufacturing Jewelers,

—AND—

Importers of Diamonds & Watches,

No. 5 Maiden Lane,

Factory, 56 West 4th Street, **NEW YORK.**

I. PFORZHEIMER. D. KELLER.

PFORZHEIMER & KELLER,

IMPORTERS OF

Watches and Diamonds

Dealers in American Watches,

AND

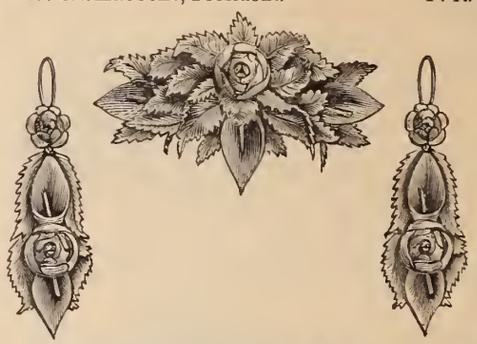
Manufacturers of Jewelry,

No. 24 JOHN STREET,

P. O. Box 4144. **NEW YORK.**

Celluloid Novelty Comp'y,

W. S. SILLCOCKS, President. F. R. LEFFERTS, Sec'y and Treas.



MANUFACTURERS OF

IMITATION

Coral Jewelry.

4 Maiden Lane, New York.

☞Our goods are sold by all the leading jobbers in the country.

T. B. BYNNER,

IMPORTER AND JOBBER OF

WATCHES,

DIAMONDS AND FINE JEWELRY,

AND DEALER IN THE

BEST CLASS OF ROLLED PLATE JEWELRY

—AND—

Key and Stem-Winding American Watches,

No. 513 BROADWAY, NEW YORK.

E. A. HALDIMAN,

IMPORTER OF

Watches, Watch Materials,

AND OPTICAL GOODS;

Also DEALER IN JEWELRY,

No. 66 Nassau Street, New York.

☞I am preparing for the convenience of country dealers a price list of the above goods. PRICES GREATLY REDUCED.

CRYSTAL CHANDELIERS,

Gilt, Bronze and Decorated Gas Fixtures,

FINE MARBLE AND BRONZE CLOCKS

Bronze Figures and Ornaments in Greatest Variety, at Low Prices,

MANUFACTURED BY

Mitchell, Vance & Co.,

Nos. 836 & 838 Broadway, New York

"Medal of Special Award," by American Institute, 1872.

No. 719, GAS FIXTURES.

MITCHELL, VANCE & Co., 597 Broadway, N. Y.:

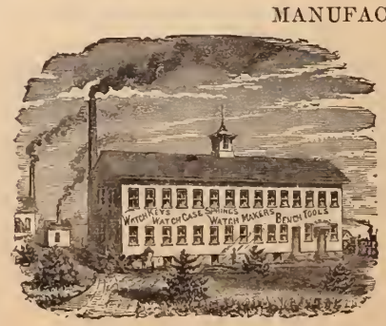
"We find the above-mentioned Fixtures and Glass Chandeliers, for design excellence of workmanship and finish in all their parts, to be the best production in the country and we may say, in our judgment, excelled by no other country in WORLD

"We recommend a MEDAL OF SPECIAL AWARD for CHANDELIERS and GAS FIXTURES. (Signed) JOHN W. CHAMBERS, Secretary.

Medal of Special Award confirmed.

A. N. Clark, Plainville, Ct.

MANUFACTURER OF



WATCH KEYS,

WATCH CASE SPRINGS,

Watchmakers' & Jewelers'

BENCH TOOLS.

Crosby's Jeweling Tools, &c.

Sold by Jobbers in Watch Materials and Notions.

☞**Small Articles in Metal Manufactured to order.**

EDWARD TODD & CO.

MANUFACTURERS OF

GOLD PENS,



Pencil Cases, Tooth Picks, &c.

No. 652 BROADWAY,

Factory, 29 & 31 South 11th St., Brooklyn. **NEW YORK.**

C. F. A. HINRICHS,

29, 31 and 33 PARK PLACE,

Cor. of CHURCH STREET, (Up-stairs) NEW YORK

Successor to M. WERCKMEISTER.

[ESTABLISHED 1801.]

IMPORTER AND DEALER IN

FANCY GOODS,

GLASS-WARE,

China, Bronzes, Clocks, Toys, &c.

Sole Agents for the Glass Factories of the Company "ANN," Namuroise, Belgium

Depot for Archery, Cricket & Base Ball Implements.

And C. A. KLEEMANN'S CELEBRATED GERMAN STUDY LAMPS.

Agent for ROGER'S GROUPS in Parian, &c.

ESTABLISHED 1855.

WELCH & MILLER,

MOROCCO, VELVET AND SATIN

JEWELRY CASE MANUFACTURERS.

☞Show Case Trays in Black Walnut and Rosewood.

Velvet Cases for Diamonds a Specialty.

No. 169 BROADWAY, NEW YORK.

CATALOGUES SENT ON APPLICATION.



In placing these Oils before the Trade, we do so with entire confidence, from many years' experience in procuring them from the fish, and in their preparation for use, and more than all, the thorough and SEVERE TESTS they have been subjected to in use upon Chronometers in our whale ships, often absent from fifty or sixty months. ☞Liberal samples furnished on application.

ROSKOPF WATCH.

J. D. HUGUENIN & CO.,

GENERAL AGENTS,

No. 12 Maiden Lane, New York.

The reputation of this Watch as an accurate timekeeper is fully established, and during the ten years that it has been before the Trade, has won an abiding reputation for fine Time-keeping qualities, and the BEST WATCH for the money in the world.

☞Send business card for price list.

MILNE & JOURDAIN,

Manufacturers of Stem-Winding Watch Crowns



13 & 15 Franklin Street, NEWARK, N. J.

Gold Crowns, for Stem-winding Movements, to suit all sizes of Imported or American Watches, in four different styles and seven sizes.

Gold Pushers for Key Movements in every size. Also Gold Crowns for fine Chronograph Watches made to order.

☞Silver Stem winding Crowns and Key Pushers on hand or made to order. Send for card and samples.

A. MILNE. A. JOURDAIN.

BERNARD LEVY,

Manufacturer of Watch Cases

—AND—

JOBBER OF AMERICAN MOVEMENTS,

No. 402 Library Street,

PHILADELPHIA.

ALSO, ORNAMENTAL ENGRAVER AND ENGINE TURNER.

Lubricating Oils, for Watch, Clock and Chronometer Makers.

The discovery of a Lubricator for FINE MACHINERY, such as Watches, Clocks and Chronometers, that is free from gum and corrosive substances, has taxed the ingenuity of hundreds of men whose efforts have proved a failure. But we are happy to say (being largely interested) that such an article has been supplied by MR. EZRA KELLEY, of New Bedford, Mass., who, after forty years study of the subject, has perfected a Lubricator that recomends itself to all who have used the *genuine*, (there having been numerous counterfeits in the market) as witness also the award of a Diploma and Medal by the judges of the late Centennial Exhibition at Philadelphia. We have no hesitation in saying that his Oils are the BEST manufactured, always uniform in quality and capable of standing all test applied to lubricating oils. We cheerfully recommend it to all who may in their business require a FIRST-CLASS LUBRICATOR







AMERICAN CLOCK CO., (Hine & Thomas.)

P. S.—The above Oils can be procured at all first-class wholesale Watch and Clock Establishments in the United States, as well as his only Agents, GRIMSHAW & BAXTER, 45 Goswell Street, London England.

New Bedford, October 15, 1877.

STERLING SILVER WATCH CASES.

HAVE WE A STANDARD FOR SILVER IN THIS COUNTRY?

WHEN WARES ARE REPRESENTED TO BE "SILVER," WHAT IS MEANT?

A Fixed and Universal Standard for Silver Wares Necessary.

It must be a High One to obtain Public Confidence!

The "Sterling" Standard Meets all Requirements.

It is Adopted by the American Watch Company

FOR SILVER WATCH CASES.

☞ STERLING SILVER WATCH CASES SOLD AS CHEAP AS THE DEBASED CASES OF OTHER MAKERS.

IT is but a few years since silver table ware was made of various qualities, from that of Sterling silver down to that base metal which the country spoon-maker said "was alloyed only one per cent."—one copper penny to a silver dollar. The results of this lack of a standard for the manufacture of silverware were the general debasement of the quality of the work, the discredit of the dealers, and an utter loss of confidence by the purchaser in the goods offered to him. The leading manufacturers of these goods, appreciating the necessity of winning back the confidence of the public, determined to redeem the reputation of silver table ware, and accordingly resolved to raise their standard to Sterling, and to keep it there. As they took pains to let the public know that there could be no swindle in the quality of the silver of which their goods were made, there was at once a demand for Sterling silver ware, and all manufacturers who did not follow their lead lost their trade and were heard of no more forever.

Now, we ask the dealers in watches if it is not just as imperative that there should be a high and fixed standard of silver in Watch Cases as in table ware? In fact, are there not many reasons why it is more important that Watch Cases should be of fine quality? Until recently the Silver Watch Case trade has been in exactly the same demoralized condition as was formerly the table ware trade described above. The highest quality recognized in silver cases was denominated "coin," meaning that it was of the standard value of United States coin, but without defining what particular "coin" was recognized as the standard. It might mean the three cent piece standard of coin, or the "dollar of our daddies." From the so-called coin standard, the quality of silver in watch cases ran down to the "one per cent. alloy," as defined by the country spoon-maker.

The consequence of this debasing of the quality of silver used in watch cases was that the public, having no guide to go by, and conscious of being swindled by unscrupulous dealers, lost confidence in all, and the trade necessarily became fearfully demoralized. This distrust of cases which the public entertained extended beyond the trade in cases, and seriously affected the business of the movement makers. People are apt to judge by outside appearances. When one finds flies in the crust of his pie, he is pretty sure to look with suspicion upon the "huckleberries" within. So the public, knowing they were being swindled in the quality of watch cases offered them by the trade, were suspicious that the movements contained in the deceptive cases were equally untrustworthy.

Finally, the American Watch Company, disgusted with the degraded condition to which the trade had sunk, resolved to make an honest and determined effort to restore it to public confidence. They accordingly determined to establish the "Sterling" standard for their silver cases, and that thenceforward, whoever should buy a Waltham silver watch case should have his money's worth; and in order that customers should know just the quality of silver they were buying, they stamped upon the inside of their cases the word "Sterling," together with their trade mark, "American Watch Company." While they thus fixed the highest standard for their cases, and guaranteed it by staking their reputation on its genuineness, they *did not advance the price of silver cases.* They simply resolved to deal fairly and honestly with the public and with the trade, by stamping their goods at their actual and precise value. This did not increase the cost of the cases to them—for their goods had always been of the highest quality—and, consequently, there was no occasion for them to advance their prices. What they did was to give every purchaser a satisfactory assurance that he was getting what he paid for—a "Sterling" silver watch case. The reputation of the Company was so high that all that was required was their simple guarantee that the cases were made by them and were of their standard make. This requirement was fulfilled by stamping on each case the word "Sterling," and their trade-mark.

Are dealers in watches aware of the fact that they can now buy a fine Waltham silver watch case of the best quality of workmanship, made of "Sterling" silver, and each case accompanied by the written guarantee of the American Watch Company that it is precisely what it purports to be, at just as low a price as the cheaply-made "three cent piece quality" can be bought for?

In all markets of the world "Sterling" is the standard for silver. It is a good old Anglo-Saxon word, and, according to Webster, means genuine, pure, true, real, positive, substantial. It was first applied to coin in England, because the English coin had a fixed standard of value; it was something genuine, real, substantial. From this fact the word "Sterling" has become a synonyme, wherever the English language is spoken, for all that is inflexibly good and trustworthy. Hence, it very properly represents the standard value of the American Watch Company's silver watch cases—they are "Sterling" in every particular, intrinsic value and workmanship. For this reason there is an increasing demand in foreign countries for Waltham watches, the quality of the cases being so fine and so trustworthy as to furnish, to a considerable extent, a guarantee of the quality of the movements they contain. Our own people may well take a hint from their transatlantic neighbors in this respect. While Americans are free to admit the superiority of the Waltham watches, they pay too little heed to the external covering of the movements. As a consequence, superior movements are often found in cheap cases made by other manufacturers, and lacking the trade-mark and guarantee of the American Watch Company. The silver of which such cases are composed may be of any quality, from "coin" of the three cent piece variety, to the "one per cent. alloy" previously alluded to. Such cases, independent of the watch, have but little market value, inasmuch as they contain variously "more copper than conscience" The workmanship may be fair enough to look upon, but the case itself, lacking the "Sterling" quality of purity and genuineness, is but a hollow mockery—a delusion and a snare.

Are Americans to remain content to wear in their pockets watch cases of a debased quality, while all foreigners reject anything below the "Sterling" standard? As we have shown, there is no necessity for their doing so. Genuine "Sterling" watch cases can be had for the same price as the cheap, unserviceable, fraudulent imitations. To get the genuine, and to be certain that they have got cases of superior quality of silver, manufactured and guaranteed by thoroughly reliable parties, purchasers have but to look inside for the word "Sterling" and the trade-mark of the American Watch Company. Having obtained one of these, they have a watch which, as Captain Cuttle would remark, "for keepin' time are excelled by none and e'kalled by few."

American Watch Company.

NEW MODEL MOVEMENTS.

We desire to state that, with a view to improving our Full Plate grades of Movements, we have entirely remodeled them, with the following special advantages:

1st, The barrel does not project beyond the top plate, thus allowing a plain, tighter-fitting dust band to be used.

2d, The pottance is immovably fixed in the plate, and need never be disturbed. With this pottance so placed it is impossible for the balance to get out of upright, and it is a convenience for repairers. This valuable improvement is secured by patent.

3d, The angles of the pallet jewels, on both sides of the pallet, are the same, and the jewels are interchangeable, which is also convenient for repairers. By this means the whole escapemeat has been improved.

4th, An improved arrangement for letting down the mainspring without taking off the hands and dial. The barrel can be removed by simply taking off he barrel bridge.

5th, All, excepting the "Broadway" and "Sterling" grades, will have machine made conical pivot balance staffs—a great improvement on the hand-made. We shall be ready to put them in the "P. S Bartlett" some time this month, and in the "Ellery" in June.

6th, All the top plate jewels are in settings except in the "Ellery" grade.

7th, The "A., T. & Co." grade is adjusted to heat and cold by new and improved methods.

8th, All grades, including "Broadway" and "Sterling" are warranted.

9th, The Stem-Winding and Setting Attachment is simpler, very convenient and more durable.

10th, The dials are firmly secured by screws.

11th, The hair-spring stud is in the cock, so that balance and cock can be taken off and replaced without danger of changing the rate of the watch.

12th, All the wheels and pinions run in the solid plate in jewels or otherwise, the third bridge being abandoned, so that no part of the train can get out of upright.

13th, Balances have mean-time screws—a great advantage in timing and poising when the watch needs repairing.

Finally, the general appearance is much improved by the design and finish of the watch. This is seen at once by comparison with the old models.

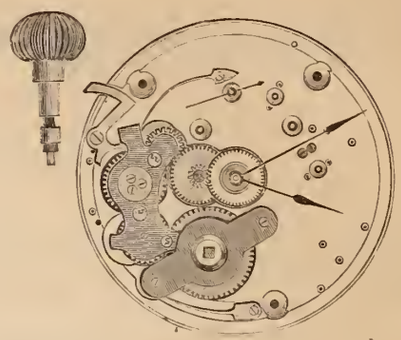
Particulars as to prices, etc., will be found on the 4th and 5th pages of our Price List, which will be forwarded on application.

ROBBINS & APPLETON, General Agents,

No. 9 BOND STREET, NEW YORK.

170 State Street, Chicago. 8 Summer Street. Boston. Waltham Building, London.





GREATLY IMPROVED QUALITY.

Immense Reduction in Prices !

HAMPDEN WATCH COMPANY,

SPRINGFIELD, MASS.

We beg to call the special attention of the **Trade** *to our new lines of* **Gilded and Nickel Goods,** *and general improvement in all grades of Movements, also to the great reductions made in prices ; and we urgently invite all who are in the Watch and Jewelry trade to carefully examine our Movements and prices for the same.*

August 15th, 1878.



☞ "*Medal and Diploma awarded at Centennial Exposition for superior mechanical execution and artistic ornamentation.*"



Established in 1854.

C. & A. PEQUIGNOT,

Manufacturers of Watch Cases.

DEALERS IN AMERICAN WATCHES AND IMPORTERS OF FINE KEY AND STEM-WINDING MOVEMENTS,

Salesroom & Manufactory, 22 South Fifth Street,

PHILADELPHIA.

A full stock of Key and Stem-Winding Gold Cases always on hand. Goods sent on approval when satisfactory references are furnished.

Established 1828.

JACOB BENNETT & SON,

Diamond Setters and Manufacturing Jewelers,

No. 108 SOUTH EIGHTH STREET, PHILADELPHIA.

WE MANUFACTURE AND MAKE A SPECIALTY OF
EVERY DESCRIPTION OF
DIAMOND MOUNTINGS
SUPERIOR IN DESIGN AND WORKMANSHIP.



MASONIC MARKS,
Presentation & Lodge Jewels,
SOCIETY AND POLICE BADGES MADE TO ORDER.
FINE WHOLE PEARL JEWELRY.

GOODS ON SENT MEMORANDUM TO ANY PART OF THE UNITED STATES.

L. & A. MATHEY,

IMPORTERS OF FINE WATCHES AND MOVEMENTS



Removed Feb. 1st, to 16 Maiden Lane.

Independent ½ Seconds, Plain Chronographs, Independent Split Seconds,
Minute Repeaters, Double Chronographs, Perpetual Calendars.
Minute Chronographs, Pocket Chronometers.
MINUTE CHRONOGRAPHS, WITH MINUTE REPEATER.
CHRONOGRAPHS, WITH MINUTE REPEATER.
AND A FULL LINE OF MEDIUM GRADE WATCHES AND MOVEMENTS.

Sole Agents for the H. L. MATILE WATCHES.

☞Timing and Complicated Watches a specialty. All our Watches are tried and tested before delivery. ☞Goods sent for examination on satisfactory references.

"TIME AND TIME-KEEPERS," an interestng essay on the rise and progress of Watch-making, sent free to any address on applicaion.





BARTENS & RICE,

No. 20 JOHN STREET. NEW YORK.

Importers of Watches,

Watch and Chronometer Makers.

WATCHES OF OUR OWN MAKE.

SOLE AGENTS FOR THE

NICOLE, NIELSEN & CO., LONDON WATCHES, AND FOR THE STAR WATCH COMPANY, GENEVA.

☞ Medals and Diplomas at the International Exhibitions in London '62, Paris '76, Vienna '72, Philadelphia '76.



HOLMES, BOOTH & HAYDENS,

MANUFACTURERS OF

ELECTRO-SILVER PLATED

Spoons, Forks, Ladles, Fancy Pieces,

Solid Handle Steel Knives, &c., of the finest quality.

No. 49 Chambers Street, **NEW YORK.**

No. 18 Federal Street, **BOSTON.**

Works at Waterbury, Conn.

HALL, ELTON & CO.,

Manufacturers of the Finest Electro-Plated Ware.



The "ORLEANS."

UNSURPASSED IN QUALITY, STYLE AND FINISH!

Factories, Wallingford, Conn. Salesroom, 75 Chambers St., New York.

BROWN & BROTHERS,

MANUFACTURERS OF

Finest Quality of Electro-Plated Flat Table Ware.

PATENTED HEAVY SPRING TEMPERED SHANK ON FORKS AND SPOONS.

ILLUSTRATED CATALOGUES FURNISHED ON APPLICATION.

WAREROOMS, No. 81 CHAMBERS STREET, NEW YORK CITY.

FACTORIES, WATERBURY, CONN. P. O. BOX 5731.

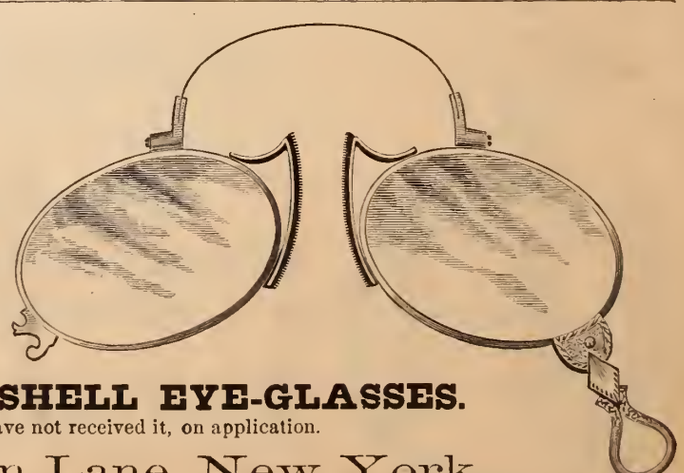
JAMES E. SPENCER, President. JOHN S. SPENCER, Treasurer.

Spencer Optical Mf'g Co.

Manufacturers of Optical Lenses.

GOLD, SILVER, STEEL AND NICKEL-PLATED

SPECTACLES.



GOLD, STEEL, RUBBER, CELLULOID AND SHELL EYE-GLASSES.

☞ Will send our Catalogue, fully illustrating all goods, to those who have not received it, on application.

FACTORIES, MT. KISKO, N. Y. Office, 13 Maiden Lane, New York.


3525

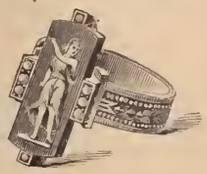

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HENRY C. HASKELL,

MANUFACTURING JEWELER,

No. 12 JOHN STREET, NEW YORK.

NOVELTIES IN BANGLE RINGS: "Mizpah," "Roma," "Salve," "Bonheur," &c.

New designs in CAMEO, ONYX AND AMETHYST RINGS. *Estimates furnished for* CLASS RINGS, BADGES, &c.

Orders solicited for goods on approval. Stone Seal Engraving and Jobbing of every description promptly and carefully done at lowest prices.

☞Write for samples Ladies' Crown Rolled Plated Chains, New Styles, "Empress," "Fifth Ave." "Brighton."

NICOUD & HOWARD,



Importers of Fine Swiss Watches,

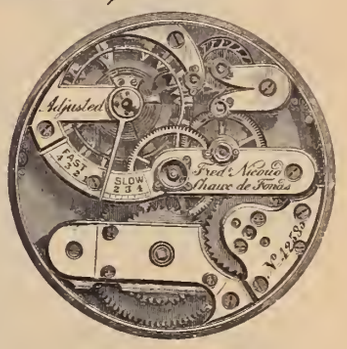
14 JOHN STREET, NEW YORK.

TRADE MARK.

NICOUD WATCH

N&H

Factory, 12 Rue St. Pierre, Chaux de Fonds, (Suisse.) Established 1847.



Sole Importers of the Frederic Nicoud, Fred Nicoud & Son, Arnold Nicoud, Louis Nicoud WATCHES.

☞*All Watches fully Warranted as to quality of Movements and Cases.*

SPECIAL NOTICE! MANUFACTURING JEWELERS, CHEMISTS, &c.

BROWN & BROS.,

No. 81 CHAMBERS STREET, NEW YORK.

Manufacture CHEMICALLY PURE COPPER for ALLOYING, and are prepared to fill orders for same, either in the Wire, Strip or Granulated form. Its PURITY has been attested as follows.

UNITED STATES ASSAY OFFICE, 30 WALL STREET
NEW YORK, Dec. 21st, 1877.

BROWN & BROS.

Dear Sir.—We have analyzed the two samples of Copper left with us on the 18th instant, one said to be foreign refined Copper as used by jewelers, the other a refined Copper as manufactured by you for the same purpose. We find both samples alike in purity, and no difference can be detected by a careful chemical analysis, both being samples of PURE METALLIC COPPER, having no traces of antimony, tin, arsenic, zinc or lead.

TORREY & EATON.



BIRCH'S PATENT

Self-Adjusting Watch Keys.

WILL WIND ANY WATCH.

FOR SALE BY THE TRADE GENERALLY.



J. S. BIRCH & CO.,

No. 38 Dey Street, New York



J. EUGENE ROBERT, Importer of Watches,

No. 30 MAIDEN LANE, NEW YORK.

Sole Agents for Longines Watch Co., "Agassiz" Ladies' Stem-Winders,
Louis Audemar's Fine and Complicated Watches.

Stem-Winding and Setting Movements,

IN NICKEL AND IN SILVER CASES.

GENTS' AND BOYS' SIZES.

Unsurpassed for durability, PRICE and Timekeeping qualities.
Manufactured on the system of uniformity of sizes
and interchangeability of parts.

FINISHED MATERIALS ON HAND.

Paris, 1867. Vienna, 1873 Philadelphia, 1876.

☞Fac-similie of the LONGINES STEM-WINDER, so popular in the Trade.



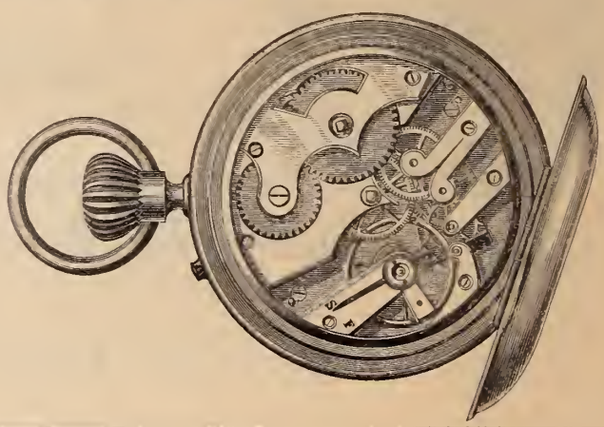
CROSS & BEGUELIN,

Makers and Importers of SWISS WATCHES,

AND DIRECT IMPORTERS OF

Watch Tools, Materials, Glasses, &c.

No. 21 Maiden Lane, New York.



The CENTENNIAL WATCH (Stem-Winding and Stem-Setting) so universally popular, has achieved a standard reputation, and is generally conceded to be the best made watch for the money in this market. Being the sole manufacturers of this celebrated Timekeeper, we are enabled to give it our strong st endorsement. Especial attention is called to the "HENRY BEGUELIN," "DROZ & PERRET," and other well known Swiss Watches, as well as to our full and complete line ot all grades of American Watches, on which we give the full trade discount.

☞ The attention of Watchmakers is directed to our new DRILLS, in sets of 21 sizes. The most complcte and serviceable drill ever offered.

JULIEN GALLET,

Importer of Watches,

From his own Factory, Chaux de Fonds, Switzerland.

No. 25 JOHN STREET,

Leon L. Gallet,
Charles Perret,
Jules Racine.

NEW YORK.

ERRICO BROTHERS,

Importers and Manufacturers of Coral, Silver, Filigree and Conch Shell Jewelry of New and Beautiful Designs.

No. 19 John Street, New York. { Manufactory, 39 St. Catarina, Chiaja, Naples, Italy.

CORAL JEWELRY.—Our stock of Coral is unusually complete and attractive, embracing the widest range of styles, patterns and shades, peculiarly desirable for the requirements of this market, while our assortment of loose goods for manufacturing purposes is almost illimitable.

SILVER FILIGREE.—We would call the special attention of buyers to this line of goods. Our stock is one of the most complete and varied to be found in the city, and consists of Combs, Necklaces, Lockets, Pins, Earrings, Hair Pins, Charms, etc., in almost endless variety.

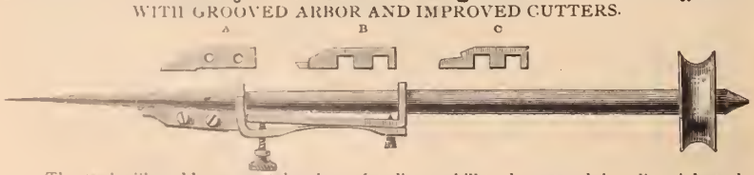
CONCH SHELL.—Of which we have a great variety of the most artistic designs, either mounted or unmounted. They are very desirable goods, and are competing with the finer class of stone cameos.

CONCH SHELL & ONYX.—The latest novelty introduced by us this season is a pleasing combination which promises to become exceedingly popular.

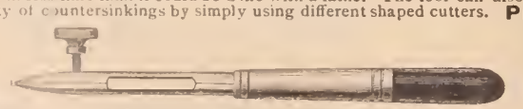
☞ Buyers visiting the city are cordially invited to examine our stock.

Schwerter's Patent Adjustable Jewel Setting and Counter Sinking Drill.

WITH GROOVED ARBOR AND IMPROVED CUTTERS.



This tool will enable any watchmaker of ordinary skill to do a good jeweling job, and in some cases in less time than it could be done with a lathe. The tool can also be used to make a variety of countersinkings by simply using different shaped cutters. **Price $6.**



This Cut represents **Schwerter's Patent Jewel Setting Opener**, a very handy tool, which will in almost every instance open a closed jewel bezel without injuring it. Price $1.25.

On receipt of Price these tools will be promptly forwarded to any address.

Address Aug. Schwerter, 51 Canal St., N. Y.

☞ A liberal discount will be made to dealers on orders of not less than ½ Dozen.

GEO. B. WHEELER,

NEW BEDFORD, MASS.

MANUFACTURER OF FINE

Watch and Clock Oil.



THE PORPOISE.

☞This Oil is made from the best of stock, is free from gum or corrosion, will stand the coldest weather, and is every way reliable.

L. HAMMEL & CO., Sole Agents,

No. 9 Maiden Lane, New York.

KOCH & CO., Elberfield, Prussia, SOLE AGENTS IN EUROPE.

TIFFANY & Co.

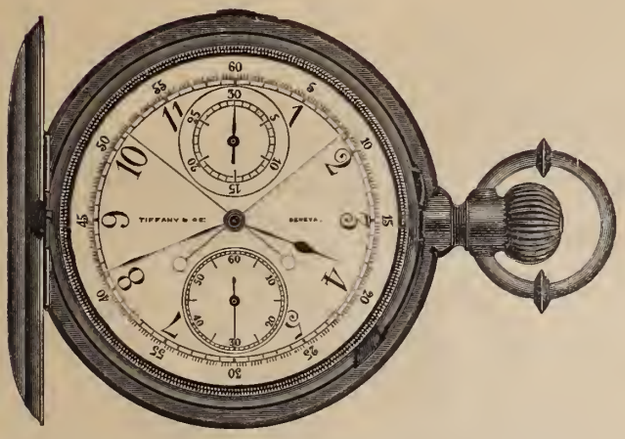
NEW YORK, PARIS, LONDON, GENEVA.

MAKERS OF

FINE AND COMPLICATED WATCHES

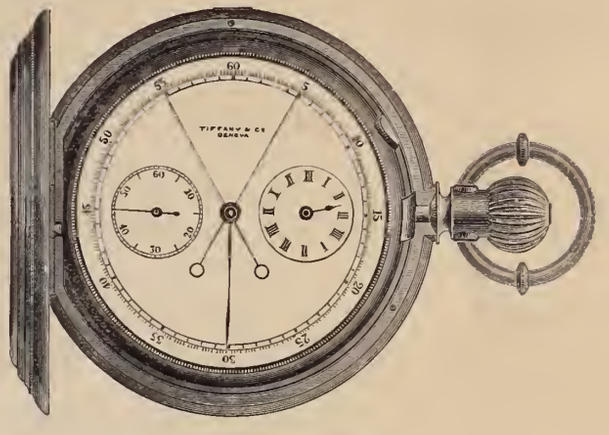
Wholesale Office, 14 John Street, New York.

GEO. R. COLLIS, Manager.



Independent Minute and Second Chronograph.

SINGLE AND SPLIT SECONDS.



Split Second Chronograph.

OUR stock consists of the STANDARD TIFFANY WATCHES with three-quarter plate (patent and plain regulator); *Bridge Movement Watches*, finely adjusted ; the largest and most varied assortment of FINE COMPLICATED WATCHES ever imported, embracing the celebrated TIFFANY CHRONOGRAPHS (fly backs), single and split seconds, marking fifth of a second, generally used as the most reliable for timing and scientific requirements.

REPEATERS, striking hours, quarters and minutes. REPEATERS, striking hours and five minutes. CALENDAR Watches showing on the dial the month, day of the month and week, and changes of the moon. CHRONOGRAPHS and REPEATERS combined, and many others never before imported.

Our LADIES' WATCHES are of all sizes, beautifully cased in 18kt. Gold, plain (red or yellow), Engine-turned, Carved, Enameled, Jeweled, Inlaid, in Hunting, half-Hunting, Open-Face, Flat, Knurl-edge, Louis XIV., XV., XVI., Jurgensen and Frodsham styles.

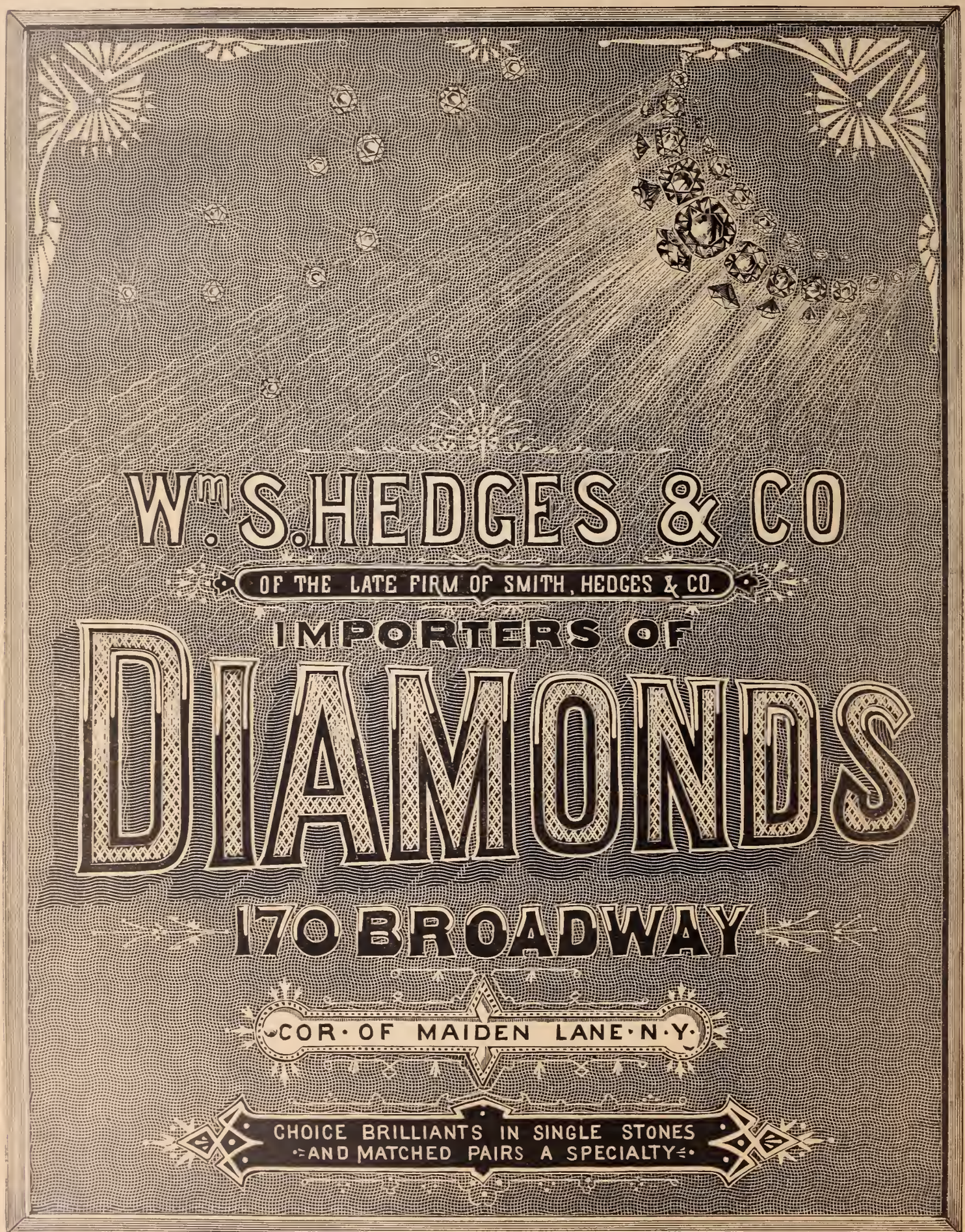
Each and every movement is finished under our own supervision, by thoroughly skilled hand labor, and finely adjusted to temperature and positions. After being cased they are submitted to severe adjustment tests for at least thirty days, and then guaranteed by us to be "as fine time-keepers to carry as are made."

All TIFFANY Movements are Stem-Winding, fully jeweled, made of nickel, artistically finished and ornamented.

ALL Watches of our make have the firm name "TIFFANY & Co." engraved upon the movements, and the trade are cautioned against apparent fac-similies put upon the market by certain *unscrupulous* dealers. The TIFFANY Watches are cased in 18 KARAT GOLD, have an established *retail* price, and we *positively* refuse further supplies to anyone underselling them.

☞*Goods sent for selection or examination on receipt of satisfactory references. Orders for engraving, ornamenting or refinishing nickel movements, and engraving inscriptions, devices, and monograms on cases promptly attended to.*

☞*Also General Agents for Messrs.* PATEK, PHILIPPE & CO., *Geneva, Switzerland, a full line of whose watches will be found at our store and offices.*


Wm. S. HEDGES & CO
OF THE LATE FIRM OF SMITH, HEDGES & CO.
IMPORTERS OF
DIAMONDS
170 BROADWAY
COR. OF MAIDEN LANE. N.Y.
CHOICE BRILLIANTS IN SINGLE STONES
AND MATCHED PAIRS A SPECIALTY



JOSEPH FAHYS,

MANUFACTURER OF

SILVER WATCH CASES,

OFFICES AND SALESROOMS;

9 Maiden Lane, New York. 78 Monroe Street, Chicago.

Every Case manufactured by me, bears my Trade Mark, acccompanied by a fac-simile of the above Certificate, and is a positive guarantee of the quality of the Case. Special attention is directed to my gold trimmed, gold joint Cases, for both Key and Stem Winding Movements. These Cases are guaranteed full weight, made throughout of *Coin Silver*, $\frac{900}{1000}$ fine, and are finished in all the desirable styles, hunting and open face, and fitting both old and new model movements.

☞ Would call the special attention of the Trade to my close fitting Bassine Cases, enriched with artistic engraving. The most popular goods in the market.

☞ Price Lists furnished by Jobbers and the undersigned.

JOSEPH FAHYS.

C. G. ALFORD & CO.,

MANUFACTURING JEWELERS,

No. 183 Broadway, New York.

Among our Specialties, we this season offer to the Trade the most complete and attractive line of Real Novelties in FINE ROLLED PLATED CHAIN ever before introduced. The standard quality of our Chain will be fully maintained, while our prices will tempt the most careful buyer.

Dealers in search of Novelties will find it to their interest to send for our Illustrated Catalogue of Designs, which will be forwarded, on application, to the Jewelry Trade only.

The Dueber Watch Case Factory,

NEWPORT, KY.



AN INDISPUTED FACT!

The "DUEBER" Coin Silver Cases speak for themselves.

We put 50 per cent. more labor and care on our cases than any other case made, and charge but a trifle more than the cheapest in the market. We solicit the critical examination of our goods by practical watchmakers.

The Dueber Watch Case M'fg Co.

CINCINNATI AND CHICAGO.

Vulcanite Jewelry Co.

MANUFACTURERS OF

WHITBY JET,

Combination Whitby Jet and Vulcanite,

Byron's Patent, May 18, 1869,

Also a full line of Lockets—plain, gold mounted and monogram.

No. 191 BROADWAY, N. Y.

☞ Agents for the NEW RUBBER WATCH CASES, Fitting all American Movements.

CHARLES KNAPP,

Engraver, Diesinker and Stamper

FOR JEWELRY PURPOSES.

Manufacturer of Shanks and Heads for Seal and Diamond Rings.

Sample Cards always on hand.

☞ Superior Carved and Fancy Band and Children's Rings, with very elaborate designs, a Specialty.

☞ Fine Engraving and Enameling Work done.

41 Maiden Lane, N. Y.

DAVID PRINCE,

Gold and Silver Refiner,

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63 RAILROAD AVENUE,

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Sole Agent for Comins' Improved Amalgamators

Mansard English Geneve Louis XV.



HENRY LEFORT,

Stem-Winding Watch Crown Manufacturer,

Crowns and Pushers in gold, all sizes, quality and color, made to order. Silver crowns and pushers always on hand.

☞ Samples sent on application.

80 & 82 Marshall Street,

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HENRY ZIMMERN,

IMPORTER OF

Watch Materials,

TOOLS, GLASSES, SILK GUARDS,

Spectacles & Eye Glasses,

No. 8 Maiden Lane, N.Y.,

FIRST FLOOR.

Sole Importer of the A. Hugenin & Gravier Mainsprings

Solid Gold Rings.

TO THE TRADE

For the past twenty seven years I have made the manufacture of PLAIN GOLD RINGS a Specialty, and have given to every branch of the business my personal attention. I am, therefore, able to sell at the LOWEST CASH PRICES, and in every case guarantee the quality. I will send to any address, with proper reference, from 50 to 500 dwts, net cash, the goods to be returned if not found satisfactory. I also make Children's Rings, Silver Rings and Half-round Chased Rings. For uniformity, and the convenience of my customers, Allen's U. S. Gauge has been adopted as the standard in my manufactory. Parties desiring Single Rings can have them forwarded upon payment of 25 cents extra. Orders for all other jewelry filled at the Lowest Cash Prices. Old Gold received and refined, and $1.03 in gold allowed per pennyweight. Yours respectfully,

J. R. WOOD, Office, 14 John St. N. Y.

Particular attention paid to Remounting. Price list furnished on application.



Full line of new and original mountings on hand.

CHAS. F. WOOD,

169 & 171 BROADWAY NEW YORK

Engraver, Incruster of Precious Stones And DIAMOND SETTER.

Incrusted Goods a specialty.

All kinds of Lapidary Work promptly executed.

Leon Jeanne. Paul Jeanne.

JEANNE BROTHERS,

MANUFACTURERS OF

DIAMOND MOUNTINGS

And RICH JEWELRY,

Patentees of Jeanne's Ear Wires,

No. 1 Maiden Lane, New York.

Designs furnished and estimates given.

KETCHAM & McDOUGALL,

No. 4 LIBERTY PLACE, NEW YORK.

MANUFACTURERS OF

Improved Gold and Silver

THIMBLES



AND THE PATENT

AUTOMATIC EYE GLASS HOLDER,

Which returns the Eye Glasses to their place on or under the lapel of the vest by simply casting them from the nose, combining all the conveniences of Cord, Hook and Case, without their annoyances.

J. B. LAURENCOT,

IMPORTER OF

WATCH GLASSES,

Optical and Fancy Goods

French Clocks, Musical Boxes, &c.

No. 33 MAIDEN LANE.

15 *Rue D'Enghien*, PARIS. *Box* 2954, *P. O.* NEW YORK.

L. BONET,

Medal at Centennial, 1876.

CAMEO Likenesses,

889 Broadway, New York.

Loehr & Koerner,

Manufacturers and Importers of

MOROCCO, VELVET, SATIN

Jewelry and Silverware Cases,

Rosewood and Black Walnut Trays,

No. 96 JOHN STREET,

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EDMOND TYLER,

MANUFACTURING JEWELER,

No. 181 Broadway, New York.

SPECIALTIES:

STONE AND STONE CAMEO RINGS.

☞ Presentation Medals and Badges of all kinds made to order.

The Morse Diamond Cutting Company,

OF BOSTON.

NEW YORK OFFICE:

192 Broadway and 3 John Street.

J. D. YERRINGTON, Agent.

☞ Rough, Boart, Cabinet Specimens, Roses and Brilliants constantly on hand, and for sale.

☞ Fractured Diamonds repaired or recut for the Trade; also Rough Diamonds cut and fashioned to order.

BOURQUIN BROTHERS,

Manufacturers and Importers of Watches,

All Kinds of WATCHES Made To Odrer.

NO. 20 MAIDEN LANE, N. Y.

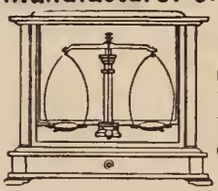
FACTORY, BIENNE, SWITZERLAND.

HENRY TROEMNER,

710 Market Street,

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Manufacturer of Fine Gold Scales,



DIAMOND SCALES,

☞ Bullion Balances and Weights, in use at all the U. S. Mints and Assay Offices.

PRICED CATALOGUE ON APPLICATION.

Solid Gold Rings—a Specialty

WM. H. ELY,

Solid Gold Rings

MANUFACTURER,

Viz., Plain, Chased, Engraved, Enameled, Engine Turned, Shield & Scale. *All qualities Warranted*

Orders Promptly Executed.

58 Nassau Street, N. Y.

SWISS WATCHES.

It is now a year and a half since an abbreviated and imperfect translation of the speech of M. Edouard Favre-Perret, late member of the international jury on watches at the Philadelphia Exposition, delivered before his countrymen and neighbors at Chaux-de-Fonds, Switzerland, was first printed in America. It has since been extensively circulated as an advertisement by the American watch companies, at an expense of thousands of dollars. If the importers of Swiss and other foreign watches have made no reply to the many inaccurate statements of this garbled and erroneous rendering, it was because they trusted that the immediate exposure, by M. Favre-Perret himself, of the glaring mistranslations and falsifications of his meaning, would suffice, as it ought, to indicate the want of fairness and justice with which the subject was treated by the American manufacturers.

It is characteristic of our people, however, to believe any statements made through the newspapers, unless they are authoritatively contradicted. We propose, therefore, in the interests of truth, to offset these unfair assertions and inferences, by a concise statement of undeniable facts, known to every one interested in the manufacture of watches, but carefully concealed or denied in the advertisements of the American companies.

The issue between Swiss and American watches has been unfairly presented as one between the products, exclusively, of hand and machine labor. In the speech of M. Favre-Perret, as printed in this country by the American manufacturers, the statement is made that "In America everything is made by machinery; here (in Switzerland) we make everything by hand." Probably M. Favre-Perret little thought that this terse expression, exaggerated after the manner of the language in which he spoke, would ever be presented to American or English readers as the deliberate statement of a literal fact; for no one knows better than himself, that machine-work enters largely into the manufacture of Swiss watches, and was so used before America ever produced a watch.

The misuse and wrong interpretation of this expression was at once seen and exposed in a letter to M. Favre-Perret, by an American, thoroughly acquainted with watch manufacture in both countries, Mr. Albert H. Potter, now of Geneva, Switzerland.

"Switzerland," says Mr. Potter, "is overflowing in her abundance of watch machinery. In Geneva we find factories with long lines of machinery of the choicest kinds; some running with power derived from immense water-wheels, others by water-engines. Many of these machines are wonderful specimens of ingenuity."

Mr. Potter's letter was a private one, written, as he declares, "purely in defense of the truth," and not intended for publication. By a happy chance, it recently came in possession of our Association, who promptly gave it to the public. It has also been translated into French and German for foreign publication. Its statements, so far as they go, are unanswerable. To their just criticisms M. Favre-Perret has made no reply. On the contrary, in his letter to the *Journal du Locle*, Switzerland, he exposes the mistranslations of the American version of his speech, and explains his meaning, without denying any position taken by Mr. Potter.

An important error in the American translation is thus exposed by M. Favre-Perret:

He says: "I said, 'It is evident that the great question is, to know whether the Americans can supply the demand of their markets; if so, we would be driven out of the American market. I except, however, fine *soignées* watches, where we are still, and hope we shall remain, the masters.'

"The American translation omitted the word '*if*,' and replacing '*fine*' (*soignées*), by '*complicated*' (*compliquées*), made me say: 'Yes, they can; we are driven out of the American market. I herein exclude, however, complicated watches.' This, it will be seen, changes completely the idea expressed, and the intention of the passage."

Emboldened by the success which attended the circulation of this garbled and untruthful version ot M. Favre-Perret's address, one of the largest American companies has recently made the sweeping and impudent claim, in a conspicuously displayed advertisement, that "American watches are in possession of the market."

The only evidence presented in support of this claim, is the admitted falling off since 1872 in the importation of Swiss watches, which had previously increased steadily for years. But with characteristic unfairness, they fail to recognize the principal cause of this falling off, in the financial panic of '73, and the subsequent years of depression. They fail utterly to show that watch importation has diminished in a greater degree than that of other Swiss and similar foreign products. It is, moreover, exceedingly doubtful whether watch importers have suffered more in these years of financial depression than the American manufacturers themselves. Several companies, as is well known, have failed, and wholly suspended their manufactures, while others have been forced by competition to a ruinous reduction of prices.

With fairness equal to their own, we might claim from these undeniable facts, that *American* watches are being driven from the market by the superior foreign products. We prefer, however, to admit the undoubted influence of universal financial depression upon the entire trade. We admit, also, that by dint of what Mr. Potter well styles their "Patent Quack Medicine style of advertising," aided by the onerous duty of 25 per cent. to which imported watches are subjected, the sale of American watches steadily increased prior to the panic of '73. But no figures are presented to show that their sales have not likewise diminished during the subsequent years.

Time is constantly demonstrating that in the production of accurate timekeepers, the skilled hand-labor of Switzerland will be found indispensable, in addition to the most perfect machine work, to secure the greatest accuracy and *durability*. The reason for the greater durability of Swiss watches, is found in their superior *fineness of finish*, which is due entirely to skilled hand-labor. By the side of a fine Swiss watch, the best American productions are heavy, coarse and clumsy. This is a necessary result of too entire reliance upon machine work.

It is an admitted law of mechanics that the coarser and heavier the machinery, the greater is the friction, and consequent wear. Hence, the less is the durability. An American watch which keeps excellent time when new, will, for this reason, lose its accuracy after a few years, and become worthless as an accurate timekeeper; while its Swiss competitor of equal grade, which can be sold for less money notwithstanding the oppressive duty, will improve with use for years, as its wearer becomes accustomed to it, and endure twice or three times as long as the product of American manufacture.

Mr. Potter, who is endorsed by a leading Philadelphia house as "as fine a workman as you can find in this or any other country," says that he went to Switzerland to manufacture a watch which "cannot be made in America, for want of proper facilities, and the indispensable hand labor."

A leading manufacturer of Dresden, who has written extensively and scientifically upon this subject, says in reply to M. Favre-Perret in the "German Watchmakers' Journal," (*Deutsche Uhrmacher Zeitung*): "On one point we take the liberty of contradicting M. Favre-Perret, and we do it after our observation on the spot (in the American manufactories); that point is the production of fine watches by machines only. * * * Every practical watchmaker knows that the regulation of a watch cannot be done by machines."

The *Elgin Times* concedes the whole point when it says: "We contend that mere machine work, with ignorance, or a listless, aimless operator as a propelling power, cannot bring about the same results as a wide-awake, skilful operator can."

With no desire to depreciate the remarkable progress in watch manufacture in this country since its inauguration less than a quarter of a century ago, it is yet certain that the ingenious and intelligent Swiss operators, with their two centuries of inherited and accumulated experience, must long excel in the quality of their labor, and consequently in the perfection and durability of its products. For the want of this skilled labor the American manufacturers are compelled to rely chiefly upon machinery. In the language of Mr. Potter, "In the case of the American production, the work on the movement ends when the machines have got through; while, on the contrary, much of the work on the Swiss watches only commences when the machines leave off."

Here, in a nut-shell, is the secret of the unavoidable inferiority of the best American as compared with the finer grades of Swiss manufacture. A watch thus skillfully finished is a genuine work of art; as different and distinct from the best purely machine-made watches as is a fine French silk from an American silk, or an oil painting from a photograph.

The only attempt to reply to Mr. Potter's strong array of facts, in behalf of the American companies has been the uncorrected republication of the garbled address of M. Favre-Perret, and a recent communication in the JEWELERS' CIRCULAR from a person by the name of Groppengeisser, whose only perceptible point seems to be the twice-repeated and italicised insinuation that America has got the monopoly of *brains*, as applied to this industry. We would respectfully ask this gentleman, whose name seems to be itself a foreign importation, and which, to save labor, we will hereafter represent by a capital G and thirteen asterisks, whether this remarkable brain power is absorbed from the soil at once by the fortunate immigrant, or whether it is necessary to be born in America in order to acquire it? And if the latter, in how many generations of descent from foreign parentage, he has been enabled to arrive at the remarkable conclusion that the Swiss workman, whose ingenuity and skill have for centuries been the wonder of the world, is deficient in "brains?" We need not descend to the level of Mr. G********** by disparaging the intellect of the American workman. His deficiencies, as compared with the Swiss, are only the natural result of the possession by the latter of generations of inherited and acquired experience.

In harmony with the disingenuous course of the American companies, a letter from Paris, published in the JEWELERS' CIRCULAR for June, contains the assertion that the entire exhibit of the American Watch Company at the Exposition has been sold to a Parisian dealer. We have most positive proof that this statement has no foundation in fact.

In the *New York Herald* of June 16th, a cable telegram announces that the entire contents of the show cases of the American Watch Company have been sold to dealers in *Great Britain, Holland, Germany and Australia*. Now it is self-evident that either one or the other or both of these statements must be untrue. If the entire exhibit has been sold to a *Parisian* dealer it could not have been sold to dealers in Great Britain, Holland, Germany and Australia. Knowing that the first assertion is false, are we not justified by the principle *falsus in uno, falsus in omnibus*, in denying the entire statement, and challenging proof?

The fact is, that while American watches have been sold, in limited quantities, in England and her colonies, they have gained no foothold whatever on the Continent of Europe; the full-plate movements particularly being entirely too thick and clumsy to suit the demands of the Continental trade.

In pursuance of this persistent and determined effort to destroy the trade in imported watches, it is said that a prominent officer of a Western Company has announced his determination "to drive the Swiss watches from this market." We would kindly suggest to him that the way to accomplish his object is to *make a better watch*, instead of publishing misrepresentations which must react in favor of Swiss products in the minds of an intelligent and fair-minded public.

Something over two years ago, the Elgin Watch Company published an Almanac for the purpose of advertising their productions. It may not have been intended for a Comic Almanac, but it had its comic features, nevertheless. As many parties in the trade may have forgotten the pearls of thought contained therein, we will gratuitously reproduce a poetic argument which was, doubtless, expected to annihilate the Swiss watch trade:

"Ho! Swiss watches, trashy botches!
Good ye are not, and naught worth.
Hail the finer Elgin timer!
The world is better for thy birth."

Allowing, for the sake of the argument, that the world *is* better for the birth of the "Elgin timer," we believe that no amount of argument could convince an intelligent public that the world is any better for the birth of the gentleman who wrote the above nursery rhyme to soothe its infant years.

We submit that until the gentleman from Elgin and his co-laborers can come before the trade and the public with something more like an argument in favor of their wares than can be discovered in mistranslated and garbled addresses, braggadocio claims which destroy each other, like the Kilkenny cats, by their own contradictions, doggerel rhymes, of which the above is a specimen, and—Groppengeisser!—the Swiss watch trade will politely decline to be annihilated or driven from the American market.

Let it not be forgotten that it is an established fact that a better watch can be made in Switzerland than in America for the same money. The Swiss have machines to make the different parts of a watch the same as we have in this country; and Switzerland contains many more skilled artisans than can be found here, in spite of our great population. In that country, moreover, on account of the low cost of living, five francs, or thereabouts, will purchase as much labor as five dollars will here, which gives them a great advantage in competition. Swiss watches continue to arrive in our ports, and, we venture to say, will continue to do so when the bard of Elgin shall be gathered to his fathers, and a grateful country, recognizing the *brains* which perished with him, shall make pilgrimages to his mausoleum.

We desire only a fair and honorable competition. Of that we are not afraid. We do not, however, propose tamely to submit to wilful misrepresentation like that which we have herein exposed. If this controversy is to be continued, we intend to oppose our *facts* to the claims of our competitors, trusting in the love of fair play which is so characteristic of the American people, to weigh our arguments carefully, and judge between us.

In conclusion, we would quote again from the letter of M. Favre-Perret: "We must not forget that Switzerland manufactures six or seven times as many watches as America; * * that she has her forty thousand workmen; that in that army she has battalions of artists and real watchmakers, who will never be replaced by machinery. The Americans know and recognize this thoroughly."

We venture the assertion that until American manufacturers are able to invent machines combining the perfection of mechanism with human intelligence, embodying generations of experience, the Swiss must remain in the future, as in the past, masters of the field in the manufacture of the perfect timekeeper.

Since writing the above, the positions therein taken have been fully confirmed by the impartial verdict of the Paris Exposition, as announced in the following telegram just received by a firm in New York, which we take pleasure in laying before the readers of the JEWELERS' CIRCULAR:

"PARIS, August 2, 1878.

"Switzerland *alone* receives for watches the GRAND DIPLOMA OF HONOR, and nine gold medals."

The Watch Importers Association of New York.

PRACTICAL HINTS

—ON—

Watch Repairing

By "EXCELSIOR."

☞Will be sent to any address in the United States on receipt of Price, $3.50.

D. H. HOPKINSON,

No. 42 Nassau Street, New York.

Established 1850.

Trade  Mark.

PETER L. KRIDER,

MANUFACTURER OF

STERLING

SILVER WARE,

Medal and Diploma Awarded, &c.

Striking Society Medals in Gold, Silver or Bronze A SPECIALTY!

ARTISAN HALL,

618 Chestnut Street

PHILADELPHIA.

L. HAMMEL & CO.,

Importers & Manufact'rs of

Spectacles, Eye Glasses,

OPTICAL GOODS,

WATCH MATERIALS,

TOOLS, &c,



We would respectfully call your attention to our new design of an improved Spectacle Case which will doubtless commend itself to your favorable consideration. The improvement, consisting in the joint being on the top of the case, making it stronger and more durable than the old style of case, and the cut away for the insertion of the Spectacles renders it the most practical case made. These goods are made in all grades of leather and for all styles of spectacles, in price from $6 to $13.50 a gross, and stamped to order with name and address of the purchaser, at $2 per gross extra.

Samples sent by mail on receipt of 10 cents on application to

L. HAMMEL & CO.,

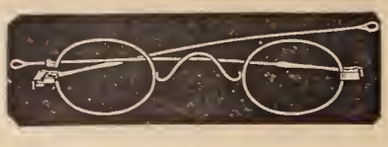
Sole Manufacturers of the EUREKA SPECTACLE CASES,

P. O. Box 1063, N. Y.

No. 9 MAIDEN LANE, NEW YORK.

GEO. W. DU BOIS,

(Successor to Albert Landsberg.)



IMPORTER AND MANUFACTURER OF

Optical Goods,

No. 36 MAIDEN LANE,

Near Nassau Street, NEW YORK

Sole Agent for

BLACK'S PATENT

Interchangeable Spectacles,

AND

EYE GLASSES.

Jewelers and others who keep spectacles for sale will please observe that, with these PATENT SPECTACLES, it is only NECESSARY to have a full *Complete Assortment of Lenses and Pebbles*, which being all of a UNIFORM SIZE, will FIT either the Gold, Silver, or Steel Frames, of which but a few of each kind are wanted; an advantage which will give a complete assortment of the finest Spectacles, for one-sixth the capital invested in a like assortment of the same quality goods of the old style frames.

For Particulars, price lists, &c., address

GEO. W. DU BOIS,

New York.

MAX L. GUTMANN,

ROCHESTER, N. Y.

Importer and Dealer in Watch and Jobbing Materials, Tools, Glasses, Chains, Guards and Jewelry.

GUTMANN'S AUTOMATIC

HAMMER AND PUNCHES.



Patented January 8th, 1878.

This Tool takes the place of the third hand, therefore its manifold uses are quickly apparent, and I would only say, that it is accompanied by six punches, to-wit: 1 prick punch, 2 hand punches, 1 closing hole punch, 1 rivet punch, 1 pinion punch, all of which fit neatly into the punch holder, and are fastened by the set screw. Its tap is alternately heavy and light, and the finger loops are assortek in sizes. The Tool is nickel-plated and boxed, ready to be mailed.

The operation is as follows: Insert your forefinger through the loop at the top and place the third finger as a guard on the lower end of the barrel, then with the thumb and second finger of the same hand, turn the cam ring which produces the concussion on the punch. This leaves the left hand free to hold the work.

Price, $2.50 Each.

☞Sent by mail, post paid, by the manufacturer, or any first-class Tool Dealer, on receipt of price.

☞Please send your order.

MAX L. GUTMANN, Patentee & Manuf't'r.

Watches and Watch Cases a specialty.

THE JEWELER AND METALWORKER.

A fortnightly Journal for Watch and Clockmakers, Gold and Silversmiths, Electroplaters, Cutlers, Opticians, and all branches of the Precious Metal Trades.

WM. ALLEN, EDITOR, 108 Barnsbury Road, London, N., England.

Subscription, per annum, FOUR SHILLINGS STERLING,

One Dollar Gold.

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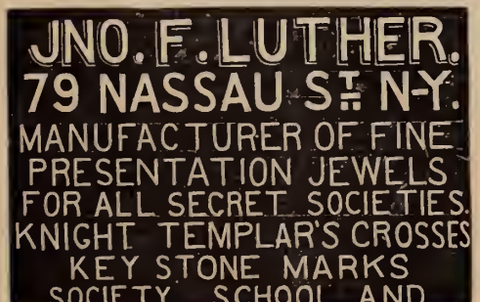
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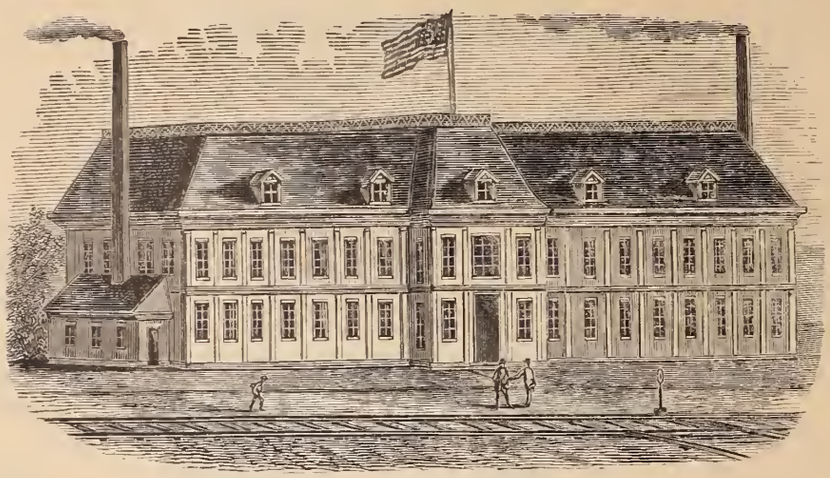
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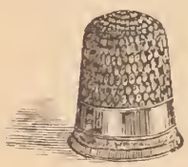
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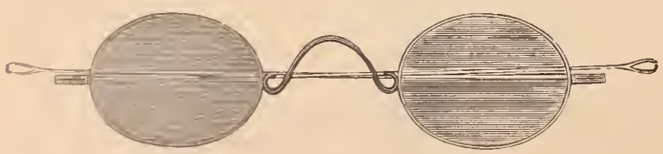
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Schwob, Adolphe—Manufacturer & Importer of Watches, 11 Maiden Laue, N. Y.

Saltzman & Co.—Manufacturers and Importers of Fine Swiss Watches, 15 Maiden Lane, (up stairs,) N. Y. Factory, Chau de-Fonds, Switzerland.

Stern Brothers & Co.—Importers of Swiss Watches and wholesale dealers in American Watches, &c., 30 Maiden Lane.

Scott, J. T & Co.—Importers of Watches, and Manufacturers of Jewelry, and Jobbers of all grades American Watches. No. 11 Maiden Lane, N. Y.

Strasburger, Louis & Co.—Importers and Makers of Watches of every description. No. 15 Maiden Lane.

Tiffany & Co.—Makers of Watches. Genera Agents for Patek, Phillippe & Co. Wholesale office, 14 John street, N. Y.

Watch Cases.

Brown, J. A. & Co.—Manufacturers of The Ladd Patent Stiffened Gold Watch Cases, &c., 11 Maiden Lane, N. Y. Factory, 58 Eddy street, Providence, R. I.

Laurent, J.—Watch Case Manufacturer, Gold and Silver American Watch Cases constantly on hand. 17 John street, N. Y.

Watch and Chronometer Repairer.

Cerf, B.—Practical Watchmaker and Repairer, No. 10 John street, N. Y. Repairing and adjusting of Fine Watches done for the trade. All kinds of escape and stem windiug wheels cut to order.

Ludeman, W. H.—Chronometer and Watchmaker. Repairing of every description for the Trade. 75 and 77 Nassau street, N. Y

Sirois, A.—Practical Watchmaker, 75 and 77 Nassau street (Room 18), N.Y. Special attention paid to the repairing of Fine Watches. Pivots inserted.

Watch Case Repairers.

Tarbox, Hiram—Watch Case Repairing, Springing, Polishing and Engine Turning, 79 Nassau street, (room 22), N. Y.

Renaud, F.—Watch-Case Repairer.—Solid and Heavy Rolled Plate Bows and Pendents. Springer and Engine Turner of Cases and Jewelry, 36 Maiden Lane

Watch Guards.

American Silk Guard Manufacturing Co.,—Our goods are warranted all silk.—Kossuth Marx & Co. No. 39 Maiden Lane, N. Y.

Watch Glasses, Shades, Etc.

Hill, Robert S.—Manufacturer of Watch Glasses, &c, dealer in Imported Glasses, Flat Glasses a specialty; also, Jeweler's Glasses. Nos. 75 & 77 Nassau street, N. Y.

CINCINNATI.

Oskamp Clemens.—Manufacturing Jeweler and Silversmith, Importer and Wholesale Dealer in Watches, Clocks, Materials, &c., 175 Vine street, Cincinnati, Ohio.

PHILADELPHIA

Booz & Thomas.—Manufacturers of Gold and Silver Watch Cases and Jewelry, 108 South 8th Street, Philadelphia.

Bennett, Jacob & Son,—Diamond Setters and Manufacturing Jewelers. 108 South 8th St., Philadelphia, Pa.

Conover David F. & Co.—American Watches, Wholesale Salesroom, southeast corner 7th and Chestnut streets, Philadelphia.

Hagstoz & Thorpe.—Manufacturers of Boss' Patent Stiffened Gold Watch Cases. Ledger Building. N. Y. Office, 13 John street.

Herold, Chas P.—Successor to Hildebraudt, Herold & Co., Manufacturing Jeweler and Diamond Setter. Diamonds. 916 Chestnut St.

H. Muhr's Sons.—Manufacturing Jewelers, Solid Gold Rings a specialty, 158 North Second st. New York Office, 11 Maiden Lane.

Rolb, G. F. & Son.—Manufacturer of fine Morocco, velvet and Cabinet Cases for jewelry watches and Silverware. 722 Sansom street.

Krider, Peter L.—Manufacturer of Sterling Silver Ware, Artisan Hall, No. 618 Chestnut street

Levy, Bernard—Manufacturers of gold and silver watch cases, and importers and dealers in Swiss and American watches, 402 Library street, Philadelphia.

McCall & Newman—Manufacturing Jewelers, Filled Plain Gold Rings a specialty, No. 625 Arch street.

Morgan & Headly.—Manufacturing Jewelers Cameo sets, Gold sets, Roman Lockets, Rings, Coral sets, and a general line of rich goods. 611 and 613 Sansom street, Philadelphia.

Pequignot, C. & A.—Manufacturers of Watch Cases, and dealers in American and Imported Watches. 22 S. Fifth street, Philadelphia.

Pierson, Edward,—Manufacturer of Fine Imitation Jewelry, Gold and Silver Electro-plater, Fire Gilder, Coloring, Etruscan and Gold Jewelry a specialty. 1223 Chestnut St.

Rosenthal, G. F. C.—Manufacturing Jeweler and Diamond Setter. Engraving and Designing of Monograms a Specialty. No. 924 Chestnut street, Philadelphia.

Scherr, L. A. & Co. Wholesale Dealer in Watches Silver Plated Ware, Spectacles, Fancy Goods, Watch Materials, etc., 726 Chestnut street.

Sheafer, W. H. & Co.—Makers of Fine Jewelry 908 Chestnut Street.

Simons, Brother & Co.—Manufacturers of Gold and Silver Headed Canes and Gold and Silver Thimbles 611 & 613 Sausom St., Phila.

The Philadelphia Watch Co.—No. 618 Chestnut Street, Philadelphia. New York Agency, L. H. Keller & Co., 64 Nassau St.

CHICAGO.

American Watch Company, of Waltham, Mass. No. 170 State street, Chicago.

Charpier & Wachter.—Watchmakers and jewelers for the trade, and dealers in all kinds of watch materials. 61 West Kinzie street.

Frese, B.—Watchmaking and Repairing for the Trade promptly attended to. Stem-winding and escape wheels cut to order. No. 99 E. Madison St., Chicago, Ill.

Purdy, J. H. & Co.—Jobbers of large and small Tools and Materials, for the use of Watchmakers, Jewelers, and kindred Trades. Spectacles—Jewelry Boxes, Plated Chains, &c., &c. No. 170 State street.

PROVIDENCE

Cooke, Daniel S. & Co.—Manufacturers of Solid Gold Initial Sleeve Buttons, Lockets, Cuff Pins, Rings, &c. 102 Orange Street.

Irons, Chas. F.—Manufacturer of Solid Gold Jewelry. Specialty Emblems, Pins and Charms Masouic, Odd Fellows, &c. 102 Friendship St.

Perkins, C. H.—Successor to Davis, Platt & Co, Manufacturer of Fine Gold Jewelry. Specialty, Ladies' Setts, Broochcs and Earrings. No. 20 Conduit St., Providence, R. I.

Potter, Charles L.—Manufacturer of Pearl Shell Goods, Patent Spiral Studs a specialty, 407 Pine street, Providence, R. I.

NEWARK.

Condit, Hanson & Van Winkle.—Manufacturers of Machines for Electro-plating, &c.

Lefort, Henry.—Stem-winding Watch Crown Manufacturers. 80 & 82 Marshall St.

Lelong, L. & Bro.—Gold and Silver Refiners, Assayers and Sweep Smelters, S. W. corner Halsey & Marshall streets, Newark, N. J.

Milne & Jourdan—Manufacturers of Stem-winding Watch Crowns Nos. 13 & 15 Franklin Ave., Newark, N. J.

Prince, David—Gold and Silver Refiner, Assayer and Sweep Smelter. Sole Agent for Comin's Improved Amalgamator. 63 Railroad Ave.

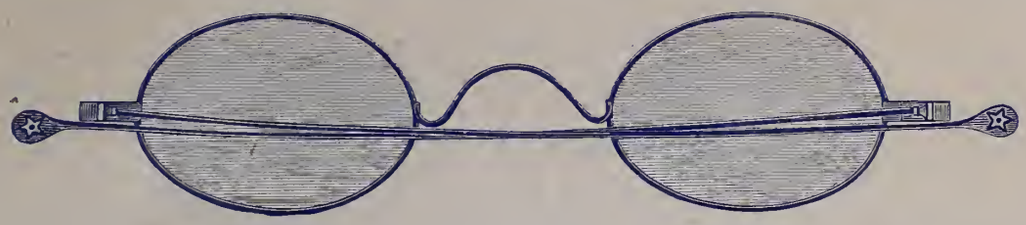
Van Houten, Sayre & Co.—Manufacturing Jewelers, 53 Chestnut street, Newark, N. J.

L. HAMMEL. LOUIS RUNKEL.

L. HAMMEL & CO.,

Importers of Watch Materials, Tools,

Watch Glasses, Silk Guards, Spectacles, Opera Glasses, Optical Goods, &c.



☞Sole Agents in the United States for **G. B. Wheeler's Star Watch and Clock Oil,** and the Celebrated **Gravier Mainspring.**

☞ We would respectfully call the attention of the Trade to the celebrated **Star Spectacles and Eye Glasses,** of which we are the Sole Importers.

We would call the especial attention of the Trade to the celebrated PANTASCOPIC STAR SPECTACLES. they are the best made goods in this market! The frames of these Spectacles are light, finely tempered and highly finished, while the lenses are remarkable for their clearness, purity, and freedom from specks and flaws.

L. HAMMEL & CO., No. 9 Maiden Lane, New York.

☞Send for Price List.



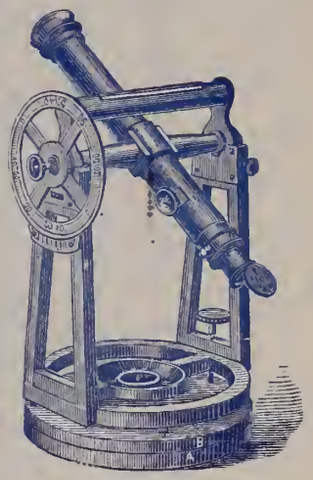
Standard Marine Chronometer
FOR KEEPING CORRECT TIME.

JOHN BLISS & CO.

STANDARD MARINE

Chronometers and Transits,

FOR WATCHMAKERS' USE.



No. 10

110 WALL STREET, NEW YORK.

IMPORTANT NOTICE.—These Transits are readily set in position without the aid of strictly correct time as a basis for that purpose. Printed instructions, easily understood, accompany each Instrument, and no calculations are required preliminary to setting in position.

As a trial only is required to insure unqualified approval, we are induced to make the following **LIBERAL OFFER**—On receipt by us of satisfactory reference, and 10 per cent. of the price, we will send one of the foregoing Transit Instruments, on hire or trial, for one month, with full printed instructions for setting up and using the same, and if purchased after trial, we will allow the whole hire to apply in part payment, and sell the Instrument on approved note at four months for the balance. Special terms for payment by installments, after trial, on application. We do not make this offer merely to hire these instruments, but to insure a trial with a view to sales, the hire received being only sufficient to cover the cost of repolishing in case they are returned. Send for Illustrated Circular giving full description.

JOHN BLISS & CO., 110 Wall Street, New York

HENDERSON & WINTER,

MANUFACTURERS OF

FINE GOLD JEWELRY

No. 15 Maiden Lane, New York.

SPECIALTIES.

STONE CAMEO, ONYX, AMETHYST, TOPAZ, PEARL AND TURQUOISE RINGS.

HENRY MAY. **Established 1854.** JOSEPH STERN.

MAY & STERN,

IMPORTERS OF

Foreign Watches, Materials and Tools

AGENTS FOR THE SALE OF ALL

DOMESTIC MOVEMENTS AND CASES,

And MANUFACTURING JEWELERS

No. 19 John Street, New York.

☞ **SOLID GOLD SEAL RINGS, in Cameo, Amethyst, Topaz and Onyx, A SPECIALTY.**

L. LELONG & BROTHER,

GOLD & SILVER REFINERS,

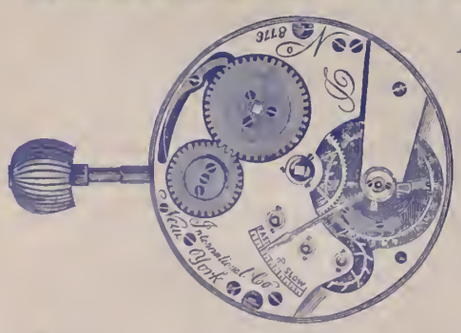
Assayers and Sweep Smelters,

S. W. Cor. Halsey & Marshall Streets,

NEWARK, N. J.

SWEEPINGS A SPECIALTY.

KELLER & UNTERMEYER,



AUTHORIZED AGENTS FOR THE SALE OF THE

INTERNATIONAL

WATCH CO.'S

WATCHES.

☞ A full and complete assortment of these goods in new and attractive Cases constantly on hand.

No. 18 John Street, New York.



P. HARTMANN,
JEWELER AND SILVERSMITH,
36 MAIDEN LANE,
NEW YORK.

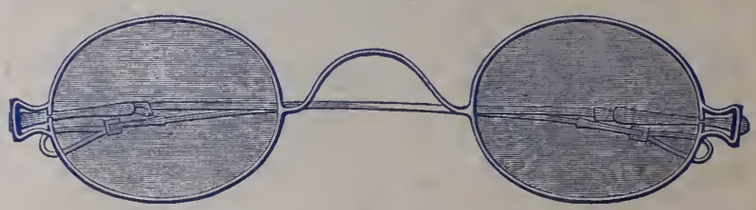
ALBERT LORSCH,

MANUFACTURER OF

PATENT ACCOMMODATING

Spectacles and Eye Glasses,

In Gold, Silver, Steel, &c.



Also Latest Novelties in Fine WATCHES & JEWELRY.

PRICES REDUCED TO SPECIE BASIS.

☞ I would call especial attention that with the above Spectacles and Eye Glasses it is only necessary to have one complete assortment of the different kinds of lenses, which being of uniform size, will interchange in all the different kinds of frames, thus giving a complete assortment for a comparatively small outlay

ALBERT LORSCH, 37 Maiden Lane, New York.

LORSCH BROS., 120 Sutter St., San Francisco, Cal.

L. & M. KAHN,

Importers of

WATCHES

Sole Agents for
James Kahn.
E. Bourquin & Fils
AND
Alphonse Matile
WATCHES.

112 Kearny St.
San Francisco,
CALIFORNIA.

5 Rue des Alpes,
Geneva,
SWITZERLAND.

No. 10 Maiden Lane, New York.

Manufacturers of the EAGLE TIMER! *the Best in the market.*

Volume. IX. No. 8.
SEPTEMBER, 1878.



American Clock Co.

581 BROADWAY, NEW YORK.

REGULATOR No. 10.



No. 172 State Street, Chicago.
No. 7 Montgomery St., San Francisco.

SOLE AGENTS IN AMERICA FOR

E. N. Welch M'f'g Co. **New Haven Clock Co.**

Seth Thomas Clock Co. **Welch, Spring & Co.**

Seth Thomas, Sons & Co.

A. S. Hotchkiss' Tower Clocks,

(Made by the Seth Thomas Clock Co.)

A NEW SETH THOMAS

REGULATOR.

14 Inch Dial. Engraved and Silvered.

8 Day Time Weight. 68 Inches High. 21 Inches Wide. 9 Inches Deep.

The Seth Thomas Clocks are to be seen at the Paris Exposition, and are in care of Mr. Louis Ritz.

SETH THOMAS.

"NUTMEG" LEVER,
Front. Back.





30 Hour Nutmeg, Brass.
30 Hour Nutmeg, Nickel.

A Small Lever Time-piece
WINDS, SETS AND REGULATES
AT THE BACK.
HANGS UP OR STANDS UP.
WINDER ATTACHED TO CLOCK.

Scale, One-Quarter Size, 3 inch Dial.

"NUTMEG" ALARM LEVER.
Front. Back.





30 Hour Nutmeg Alarm, Brass.
30 Hour Nutmeg Alarm, Nickel.

AMERICAN CLOCK CO., (Hine & Thomas.)

Ansonia Clock Company,

MANUFACTURERS OF AMERICAN CLOCKS,

And IMPORTERS of CLOCKS of EVERY DESCRIPTION.

SALESROOMS: 19 & 21 CLIFF STREET, and 5 CORTLANDT STREET, (Near Broadway NEW YORK.

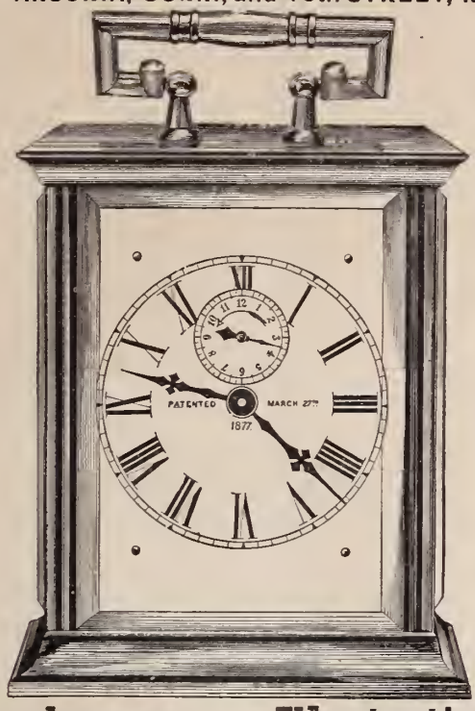
FACTORIES ANSONIA, CONN., and 10th STREET, NEW YORK.



Peep O'Day Alarm.

One-half the size: Stem-Winding: Sets the alarm and winds at the back. "Only requires one spring" to be wound, and will go in any position.

Nickel or Gilt. CARRIAGE. Stem-Winder.



One Day Time, Alarm. No. 1, height, 5½ in. Eight Day Time. No. 2, height, 4½ in. Only one spring to wind. No. 3, height 3½ in.



Aladdin Night Light, Extra.

Nickel and Gilt. Stem-Winder. Patented November 1, 1877. One Day Time. Four inch dial. Height, 7 inches.

The above are excellent Time-keepers. Illustrations and prices on application.

A NEW LINE OF NOVELTIES WILL SHORTLY BE OFFERED.

Waterbury Clock Comp'y

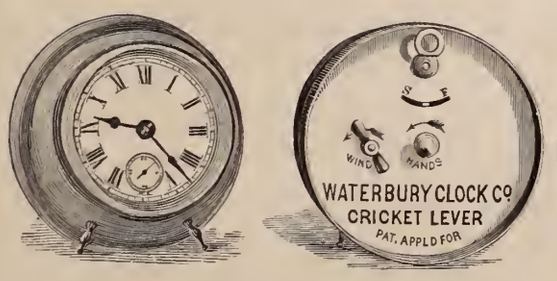
Manufacturers and Jobbers of AMERICAN CLOCKS,

"Cricket." No. 4 Cortlandt St., New York. **"Sunrise."**

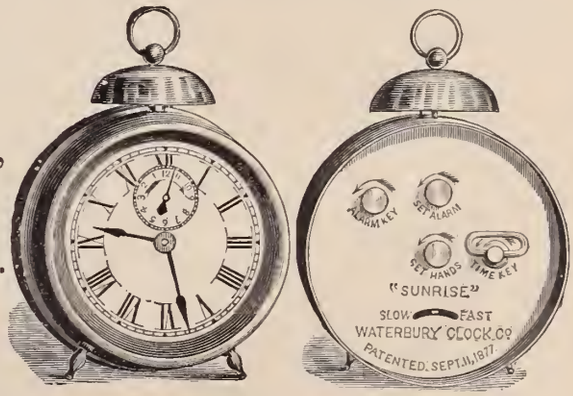
30 Hour Lever Time Piece. **30 Hour Lever Time Piece, Alarm**

197 State Street,
CHICAGO.
113 Sansom Street,
SAN FRANCISCO.
Factories, - - Waterbury, Conn.

M. BAILEY, Treasurer.



ONE-THIRD ACTUAL SIZE.



ONE-THIRD ACTUAL SIZE.

"CRICKET" & "SUNRISE"

Are Stem-Winders, No Keys Required, Reliable Time-Keepers, Will Run in any Position, Separate Alarm Spring, Set and Regulate at the Back. Nickel-Plated Cases.

SOLE AGENTS FOR THE ITHACA CALENDAR CLOCK COMPANY.

Illustrated Catalogues and Price Lists furnished to the Trade upon application.



Mabie, Todd & Bard,

Manufacturers of

GOLD PENS,

Pen Holders, Pencil Cases and Tooth Picks,

in Gold Mounted Rubber, Pearl, Ivory and Solid Gold,

180 Broadway, **New York.**

We were awarded a Medal & Diploma, at the Centennial Exhibition, for excellence of designs, and high quality of workmanship.

Illustrated Catalogues and Price Lists sent to the trade upon application.

LOUIS STRASBURGER & CO.,

Importers and Makers of Watches,

OF EVERY DESCRIPTION,

From the Finest Stem-Winding and Setting Goods to the Lowest Priced Watch in the Market.

OUR STOCK is unusually complete and attractive and embraces an assortment of the best COMMERCIAL WATCHES to be found anywhere ranging from $4.00 to $600 each.

We would also call the attention of buyers to our select display of fine TIMING and COMPLICATED WATCHES, CHRONOGRAPHS and REPEATERS, of every description, from the establishments of the most eminent makers.

☞ We are also the Sole Agents for the INTERNATIONAL WATCH CO.'s WATCH, so well and favorably known in this market.

LOUIS STRASBURGER & CO.,

NO. 15 MAIDEN LANE, NEW YORK.

Diamond Bureau,
No. 30 Boulevard Haussmann,
PARIS

WATCH FACTORY,
CHAUX DE FONDS, SWITZERLAND.

ILLINOIS

Springfield Watch Company,

MANUFACTURERS OF

KEY AND STEM-WINDING MOVEMENTS.

No. 1



Key Wind, 7 Jewels.

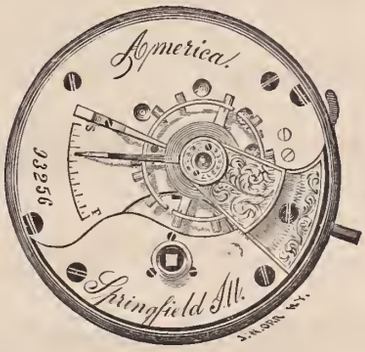
18 SIZE,

FULL PLATE,

CUT

EXPANSION BALANCES.

S. S. Dials.



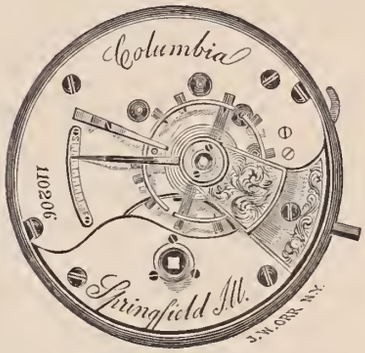
Stem Wind, 7 Jewels.

No. 1

No. 2



Key Wind, 11 Jewels.



Stem Wind, 11 Jewels.

No. 2

The above new and desirable grades are now being delivered, and are furnished as above described, or or without *grade* trade marks, and in such case, being designated by the numbers 1 and 2, and engraved "*ILLS. SPRINGFIELD WATCH CO.*"

"Interior," "America," and "Columbia" *Stem-Winders* will be furnished with *XII.* at pendant and seconds opposite, for *OPEN FACE* Stem-Winding Cases. Any *other* grades on our list will be mode *on order* in the same manner, in quantities of five or more of a grade—without extra charge.



Improved *Old English* Dials have been added to the "*Bunn*" grade: handsome *double sunk* Old English Dials, to the "*Stuart*" grade, making them especlally attractive and desirable. This the Trade will doubtless appreciate when taken in connection with their known time-keeping qualities.

New Price-Lists, having above additions, dated *AUGUST 1st*, will be furnished by wholesale dealers, or the Company, upon application, enclosing business card

OFFICES.

11 MAIDEN LANE, NEW YORK. SPRINGFIELD, ILLS.



Silver-Plated Ware.

THE MERIDEN BRITANNIA COMPANY,

Union Square, New York.

(No. 46 East 14th Street.)

☞ARE MANUFACTURING AND HAVE ON EXHIBITION A CHOICE SELECTION OF DESIRABLE ARTICLES ESPECIALLY APPROPRIATE for the SEASON.



Centennial Medals and Diplomas were Awarded to this Company for

"Superior" Silver-Plated Ware.

EXTRACT FROM CENTENNIAL JUDGES' REPORT.

"Their LARGE VARIETY of Silver-Plated White Metal Hollow Ware is of EXCELLENT QUALITY and FINISH, and of TASTEFUL DESIGNS."

"Their Silver-Plated Forks, Spoons and Knives are of *Superior Quality and Excellent Finish.* Their XII Plating, or extra plating on exposed parts, *deserves commendation.*"

EXTRACTS FROM AMERICAN INSTITUTE REPORT.

"The Porcelain-Lined, Doubled Walled Ice Pitchers are A 1, and possess all the qualities the Company claim."

"We consider the goods made by this Company by far the best made in this country, and, we believe, in the world."

☞First Premiums awarded at all Fairs where exhibited, from World's Fair, 1853, to American Institute Fairs, 1873, 1874 and 1875, inclusive, and at Philadelphia Centennial Exhibition, 1876.

Factories, West Meriden, Conn.

SIMPSON, HALL, MILLER & CO.

Fine Electro-Silver Plated Ware,

Factories, Wallingford, Conn. Salesroom, No. 676 Broadway N. Y.

One of the oldest and most reliable manufactories in the country.

Our Solid Table Ware is made of the Best Nickel Silver.

Spoons, Forks, Ladles, Pie Knives, &c.

IN GREAT VARIETY OF PATTERNS.

Solid Steel Knives, superior article and Heavily Plated for Service.



OUR HOLLOW WARE consists of Tea Sets, Urns, Tea Trays, Spoon Holders, Milk and Water Pitchers, Butter Dishes with glass plates, Cake Baskets, Biscuit Bowls, Berry Dishes, Fruit Stands, Pickle and Jelly Dishes, Dinner and Breakfast Castors, Oyster and Soup Tureens, Baking Dishes, Steak Dishes, Vegetable Dishes, Celery and Salad Dishes, Syrup Cups, Tray and Rack for holding Spoons and Forks, also with Call Bell attached (patented). Toilet Sets in great variety of patterns, beautiful glass, richly mounted with silver, Vases, Card Stands combined. The glass Vases are of various patterns and styles; cut and fancy, of the most beautiful designs and mounted in the most elegant silver frames and stands. Centre Pieces and Epergnes, the most elaborate or plain, as desired; in fact thousands of articles in the line of Silverware, and all warranted to be first-class and exactly as represented.

☞ Our facilities being second to none to produce the finest and most serviceable *ELECTRO PLATED WARE*, at the lowest possible price. By years of experience, close attention to business, and our unsurpassed facilities, we are enabled to produce goods as cheap, if not cheaper, than any other concern in this country, consequently dealers can feel assured that they will always get goods from us at the very lowest price. The pride of our house is to make the finest goods, and sell them at fair prices, and please our customers, by honorable dealings, and retain the reputation which, we believe, is unquestioned as to our making the best of goods and also the cheapest.

PATENT BUTTER DISH.

We have introduced this season an entirely new and novel Butter Dish. The convenience of its opening and closing can but strike one favorably. Its beauty of design and workmanship must please everybody. We have produced other valuable designs and patents in the way of Butter Dishes as well as many other useful articles in our line, but this is the most complete and perfect in its arrangement of anything heretofore produced, and must take the lead of all other first-class Butter Dishes in the market.

SUPERIOR ELECTRO-PLATE!

MANUFACTURED BY

THE MIDDLETOWN PLATE COMP'Y,

Factories, MIDDLETOWN, Conn.

Salesrooms, { 13 John Street, New York.
120 Sutter Street, San Francisco.

SUPERIOR HARD WHITE METAL,
SUPERIOR HEAVY PLATE,
SUPERIOR DESIGNS, WORKS OF ART.

Wedding and Fancy Presentation Pieces in Elegant Designs.

NEW DESIGNS for FALL of 1878.



No. 993, Fruit Dish, gilt, $20.

IN TEA SETS, URNS, WAITERS,
BUTTERS, SYRUPS, SPOON CUPS,
PITCHERS & PITCHER SETS,
BASKETS, BERRY DISHES,
PICKLE CASTERS, and
Every Variety of HOLLOW WARE,
Knives, Spoons and Forks, and all
Articles made in Electro-plate.



No. 1, Nut Bowl, gilt, $16.50.

☞ *Dealers will be supplied with the* **best quality,** *and at* **lowest price.** *Our designs are* **original.**

Photographs sent, on application, to dealers.

GOODS FOR EXPORT.

Middletown, Conn. and 13 John St., New York.

J. C. AIKIN. H. A. LAMBERT. J. B. SHEA.



AIKIN, LAMBERT & CO.

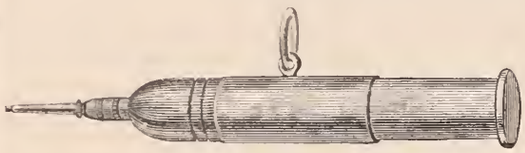


Removal to No. 23 MAIDEN LANE, NEW YORK.

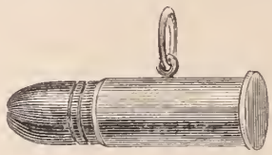
MANUFACTURERS OF GOLD PENS,

Pen and Pencil Cases, Pencils, Tooth Picks,

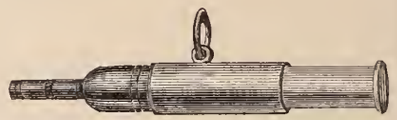
And Leading "Novelties" in Pencil Goods.



Pat. Plated Cartridge Pencil.



Cartridge Pencil (closed.)



Pat. Plated Cartridge Watch Key.

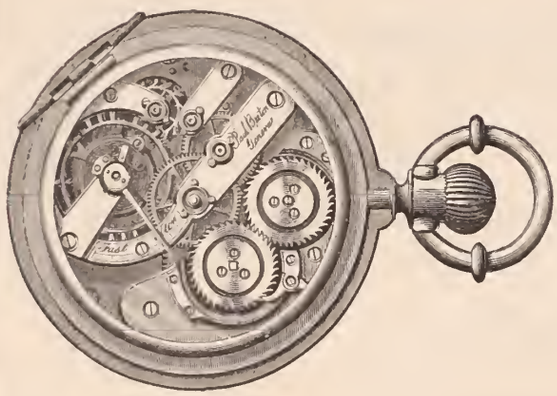
In connection with our Gold Pen and Pencil goods, our line of "Novelties" in Pencil Charms has been largely augmented this season by a variety of NEW and NOVEL patented articles, which are artistic in design, and will prove a valuable addition to the line of Holiday goods.

We are also making this fall some Charm NOVELTIES, adapted to the JEWELRY trade, and on which we are offering SPECIAL INDUCEMENTS. ☞ Send for Circular and Price List.





ALSO,



Importers of all Grades of

WATCHES.



Sole Agents for

"Paul Breton" and "Chas. Latour," Geneva.

SPECIALTIES.

AGASSIZ Movements, Gilt and Nickel, Stem-winding, fitting Ladies' Riverside Case.
CHAS. LATOUR " " " Key-winding, " 10 and 16 size Waltham Case.
PAUL BRETON " " " a full line of these CELEBRATED watches.

Metal Cased Open Face STEM-WINDING, "EXCELSIOR" and "LONGINES," 16, 18 and 20 line, the BEST metal watches, in STYLE and QUALITY, in the market. BLACK and FANCY DIALS are NOVELTIES in these watches, which are having a rapid sale.

AMERICAN WATCHES of all kinds. Gold Cases of all styles made to order. Sole Agents for EUREKA HORSE TIMER, the cheapest reliable Timer ever made, and for PNEUMATIC TIMER, which does not require the use of the hand.

We guarantee all watches sold by us, and have recently reduced our prices.

Our display of JEWELRY for the Fall Trade is complete, consisting of a general line of RELIABLE goods, both in GOLD and ROLLED PLATE, of new and tasty patterns. Special attention paid to ORDERED WORK and REPAIRS. GOODS SENT ON APPROVAL and CORRESPONDENCE invited. Those not acquainted with us will oblige by giving references when ordering.

Branch, No. 113 East Madison Street, Chicago.

GORHAM M'FG. CO.

SILVERSMITHS.

Factories, Providence, R. I.

SALESROOMS,

37 UNION SQUARE, N. Y.

Branch Office, 120 Sutter Street, San Francisco.

Sterling Silverware and the Gorham Plate.

HOLLOW-WARE.—Our manufactures in this important branch are of the widest range, covering all the wants for household use and decoration. Prize and Presentation Sets and pieces for general and specific purposes.

SPOON-WARE.—Complete illustrated sheets of our SPOON AND FORK PATTERNS, with price list, will be furnished to the trade upon application. The Hindostan which has been added to our list the present season has been most favorably received. Its style of ornamentation is, as its name indicates, Indian or Hindostan, equal to the Raphael in beauty of design, smooth to the touch, free from the objectionable feature of sharp edges, and by a judicious distribution of metal the very desirable feature of strength in the shank is obtained, giving the appearance of a much heavier spoon.

FLAT-WARE.—The variety of combinations, suitable for wedding and holiday gifts, range from a single article of trifling value to elaborate combinations of several hundred pieces. New styles of decoration in color has been an attractive feature in the productions of the present season.

CASES.—Elegant and desirable Cases for these varied combinations are of our own manufacture, including Plate Chests substantially made in plain and ornamental wood.

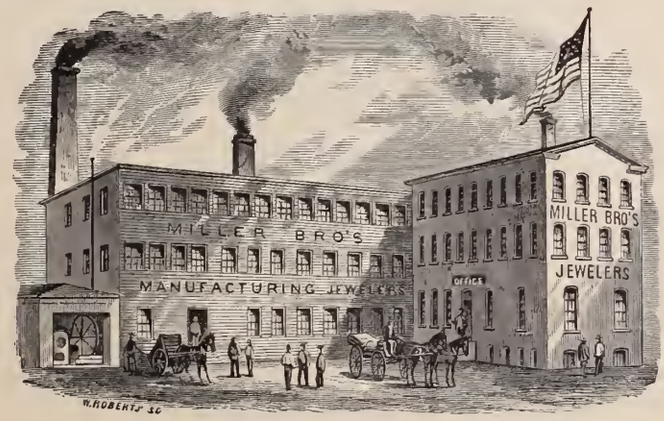
MILLER BRO'S,

MANUFACTURING JEWELERS,

No. 11 MAIDEN LANE, NEW YORK.

Manufactory, 47, 49 & 51 Franklin Street, Newark, N. J.

INITIAL GOODS



A SPECIALTY!

Seals, Lockets, Sets, Sleeve Buttons, Studs, Collar and Chemise Buttons.

ATTENTION IS INVITED TO OUR

NEW STYLES OF ETRUSCAN SLEEVE BUTTONS,

MOUNTED WITH

RUSTIC LETTERS,

BIRDS, ANIMAL HEADS AND FANCY ORNAMENTATIONS

DAVID F. CONOVER & CO.,

(Successors to Wm. B. Warne & Co.)

Importers, Manufacturers and Wholesale Dealers in

WATCHES AND JEWELRY,

Silver and Silver-Plated Ware,

American Watch Wholesale Salesroom,

Southeast Corner Chestnut and 7th Sts.,

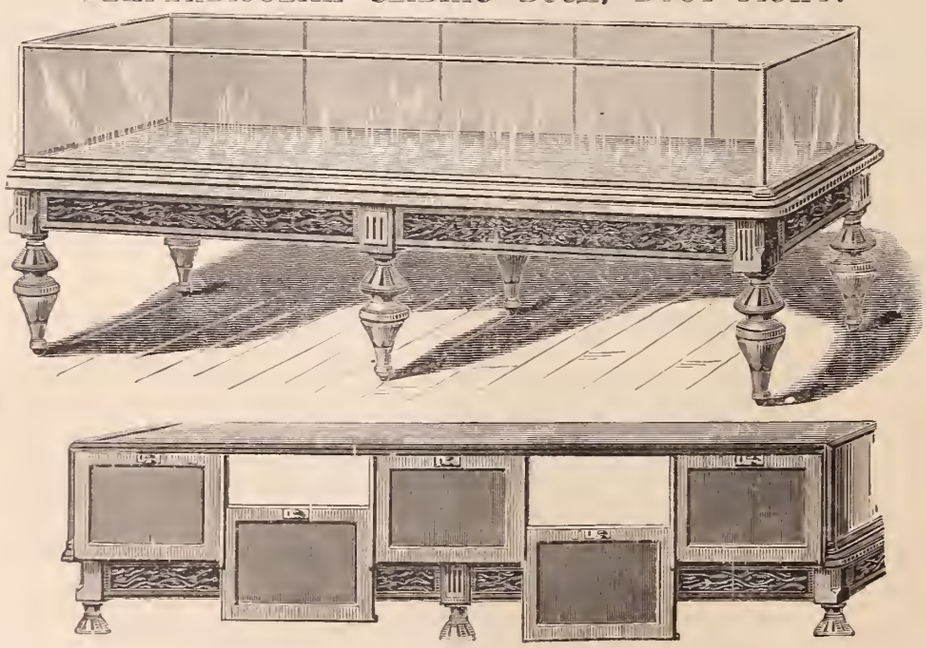
(FIRST FLOOR.)

David F. Conover,
B. Frank Williams,
C. Edgar Righter.

PHILADELPHIA, PA.

PATENT IMPROVEMENT IN COUNTER SHOW CASES,

PERPENDICULAR SLIDING DOOR, DUST-TIGHT.



REAR VIEW OF CASE SHOWING SLIDING DOOR.

Its advantages are as follows:—The doors are more conveniently opened and closed, less liable to get out of repair or broken, articles are more easily reached in wide cases, mirrors are more safe, it dispenses with hinges, economizes room, excludes dust, and is air tight *when closed.*

☞ Drawings furnished and estimates given for fitting stores in cabinet work complete.

References:—Gorham Mf'g Co., Rogers & Bro., Mitchell, Vance & Co.
Meriden Britannia Co., M. S. Smith & Co., Detroit, Mich.
D. Valentine, Syracuse, N. Y.

B. & W. B. SMITH,

220 West 29th Street, New York.

C. G. ALFORD & CO.,

MANUFACTURING JEWELERS,

No. 183 Broadway, New York.

AMONG OUR SPECIALTIES, we this season offer to the Trade the most complete and attractive line of REAL NOVELTIES IN FINE ROLLED PLATED CHAIN ever before introduced. The standard quality of our Chain will be fully maintained, while our prices will tempt the most scrutinizing buyer.

Dealers in search of Novelties will find it to their interest to send for our ILLUSTRATED CATALOGUE of Designs, which will be forwarded, on application, to the legitimate Jewelry Trade ONLY.

J. LAURENT,

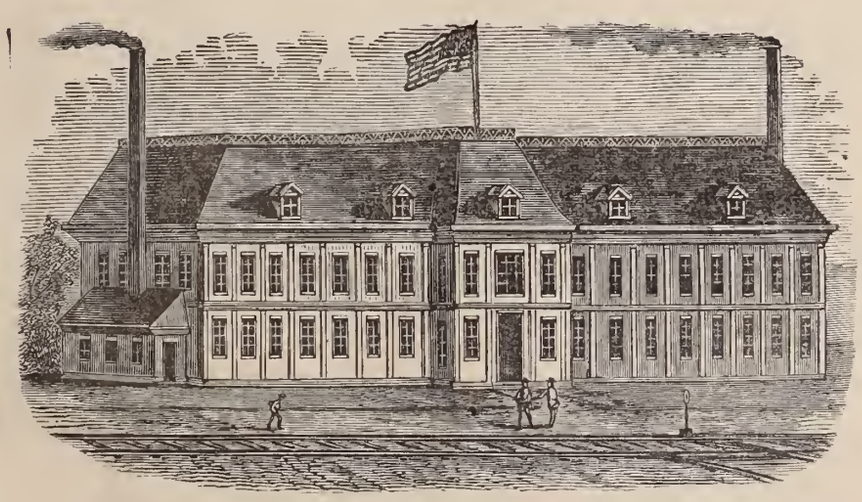
MANUFACTURER OF

Gold and Silver WATCH CASES,

OFFICE,

182 Broadway,

NEW YORK.



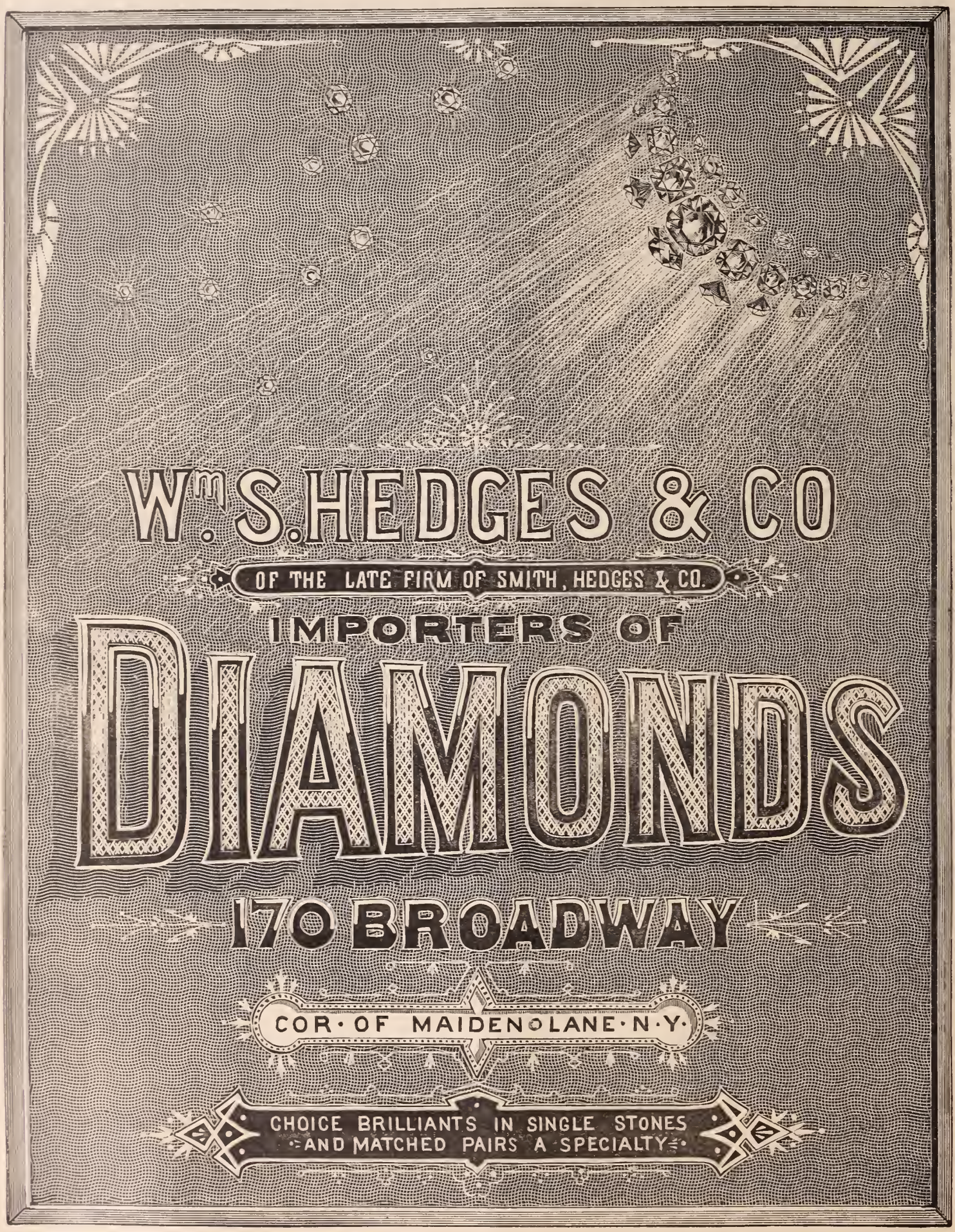
FACTORY,

Linden, N. J.

NOT IN THE "COMBINATION."

Having declined to enter into the recent "Combination" on Cases, am now offering my goods, which in all respects are equal to any in the market, at prices below all others.

☞ NEW PRICE LISTS supplied to dealers upon application.


Wm. S. HEDGES & CO
OF THE LATE FIRM OF SMITH, HEDGES & CO.
IMPORTERS OF
DIAMONDS
170 BROADWAY
COR. OF MAIDEN LANE. N. Y.
CHOICE BRILLIANTS IN SINGLE STONES
AND MATCHED PAIRS A SPECIALTY

CHAS. P. HEROLD,

(Successor to HILDEBRANDT, HEROLD & Co.)

Manufacturing Jeweler, Diamond Setter

AND DEALER IN

DIAMONDS,

No. 916 Chestnut Street, PHILADELPHIA, Pa.

N. B.—A large stock of 18kt. DIAMOND MOUNTINGS, such as cluster and solitaire Rings, Earrings, Lace Pins, Shawl Pins, Cr sses, Studs and Gents' Pins, &c, all of which are of my designs, and are made in the finest style and finish.



NEW YORK OFFICE, No. 192 BROADWAY.

WM. C. GREENE. B. W. GREENE. GEO. D. BRIGGS.

Van Houten, Sayre & Co.,

Manufacturers of Fine Jewelry,

FACETED GOODS,

Office & Factory, 53 Chestnut Street,

NEWARK, N. J.

SPIESS & ROSSWOG,

MANUFACTURERS OF FINE

Jewelry and Diamond Goods,

LOCKETS, CROSSES, SLEEVE BUTTONS & NECKLACES,

RICH SETS IN CORAL, ROSE, STONE CAMEO, INCRUSTED AMETHYST AND CORAL CAMEO.

Nos. 9 & 11 Maiden Lane,

NEW YORK.

J. EUGENE ROBERT,

Importer of Watches,

No. 30 MAIDEN LANE,

NEW YORK.

Sole Agent for the L. Audemar's Celebrated Watches.

Dorrance, Edge & Co.

MANUFACTURERS OF

THE CELEBRATED WOVEN FABRIC

GOLD CHAIN.

Elegantly Mounted Bracelets, Opera, Leontine,

VICTORIA WATCH GUARDS & NECKLACES, in all the Newest Designs.

☞Our stock is unusually complete, and, in addition to the above, a variety of **Necklaces**, from 1½ to 40 dwt. each, to which we invite the attention of buyers.

No. 9 John Street, New York.

Factory, 46 Greene Street, Newark, N. J.

HODENPYL, TUNISON & CO.,

MANUFACTURERS OF

Fine Gold Chain and Jewelry.

A FULL ASSORTMENT OF

ROMAN BAND BRACELETS,
ROMAN NECK CHAINS AND PENDANTS,
LOCKETS, SLEEVE BUTTONS,
STUDS, AND CHAIN MOUNTINGS.

OUR STYLES ARE VARIED, NEW AND NOVEL.

Salesrooms, No. 170 Broadway, New York.

☞ Desirable goods for the Export Trade.

ESTABLISHED 1837.

VICTOR BISHOP & CO.

IMPORTERS OF

Diamonds, Precious Stones, Mosaics, Cameos

CORAL JEWELRY,

Imitation Stones, Roman Pearls.

FINE FRENCH BEADS,

Of all Colors, in Strings and Necklaces

Diamond Scales, Gold Shells, Silver and Copper Foil, &c.

Enamel of all colors and quality; also Platinum and Copper.

No. 47 NASSAU STREET, NEW YORK.

House in Paris, 66 Boulevard de Sebastopol.



TINGLEY, SINNOCK & SHERRILL,

MANUFACTURERS OF

FINE JEWELRY,

NO. 5 MAIDEN LANE, NEW YORK.

Factory, Newark, N. J.

J. B. & S. M. KNOWLES,

MANUFACTURERS OF

Sterling Silverware

Office, No. 20 MAIDEN LANE,

NEW YORK.

Factory, No. 95 PINE STREET, PROVIDENCE, R. I.

ESTABLISHED 1859.

RINGS A SPECIALTY.

BRYANT & BENTLEY,

No. 12 Maiden Lane, New York.

MANUFACTURE A LARGE VARIETY OF

FINE SOLID RINGS,

For Ladies and Gentlemen, in CAMEO, AMETHYST, ONYX, TOPAZ, TURQUOISE, GARNET and other stones, Fine CAMEO, CORAL and ROMAN SETS of new and handsome designs. LOCKETS, MEDALLIONS, SHAWL and SCARF PINS, SLEEVE BUTTONS, STUDS, &c. All goods warranted.

☞ We continue to manufacture several hundred patterns of **HARD SOLDER RINGS**, in every style, for men, women and children, stamped and warranted 16 carat fine.

BUCKENHAM, COLE & SAUNDERS,

SUCCESSORS TO

BUCKENHAM, COLE & HALL,

IMPORTERS OF

Diamonds, Pearls

AND OTHER PRECIOUS STONES,

MANUFACTURERS OF FINE JEWELRY,

10 Maiden Lane, New York.

☞ A large stock of FINE DIAMONDS, Mounted and Unmounted kept constantly on hand. Goods sent on approval to any part of the country on receipt of satisfactory references.

DENNISON & CO.,

MANUFACTURERS OF

Paper Boxes, Jewelry Cards, Tags,

PINK AND WHITE COTTON,

JEWELERS' AND PLATE BRUSHES, SEALING WAX, RUBBER BANDS, &c.

SEND FOR CATALOGUE.

TISSUE PAPERS. Proprietors "Globe," and Centennial Prize "Excelsior," and Importers of English Grass, Bleached and Colored Tissue Papers, from the celebrated 39 mill.

Sole Proprietors of Millers' Specialties!

JEWELRY CASKETS, SILVER WHITE CASKETS, and

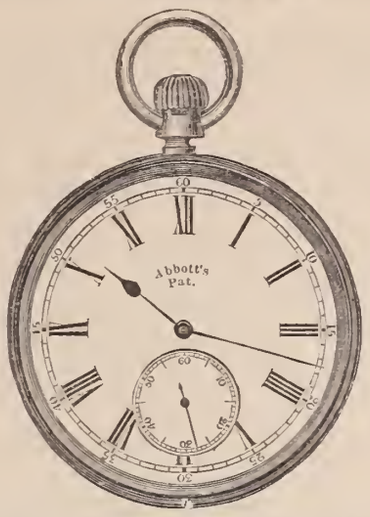
SILVER WHITE, the best article for Cleaning Silver and Plated Ware. Samples furnished the Trade for distribution.

DENNISON & CO.,

Boston, New York, Philadelphia, Chicago, Cincinnati, St. Louis.

☞ **The Patent 12 o'clock Stem-Winders and Stem-Setters, with Seconds Hand; made to Wind at Figure XII. instead of at Figure III.**

☞ We have also on hand the **Arburndale Horse Timers,** for which we solicit orders



☞ We desire to call the special attention of Watch Dealers and Jobbers to the fact that we have made arrangements with the patentee for the manufacture and exclusive sale of his **Patent Open Face, Full Plate, Stem Wind Attachments,** indicated in the annexed design

☞ These Stem Wind, and Hand Set Attachments can be applied to the regular 18 size Ke Winding Movements, made by the WALTHAM ELGIN and SPRINGFIELD WATCH COMPANIES, and warranted by us to be both accurate and reliable.

The great increase in the demand for American **Open Face** Watches in the past few years renders this a very desirable improvement. ☞ When requested we will send samples of these Watches for examination and approval.

J. T. SCOTT & CO., No. 11 Maiden Lane, New York.

Jobbers, Manufacturers & Importers of Watches, Jewelry, Chains, Diamonds, &c.

SAXTON, SMITH & CO.

MANUFACTURERS OF

Fine Gold Chain.

No. 194 BROADWAY

New York.

Factory, No. 183 Eddy Street, Providence, R. I.

☞ **Sole Agents for the new PATENTED CHAIN BAR, containing a Detachable Pencil.**

WOOD & HUGHES,

STERLING

Silverware Manufacturers

No. 16 JOHN STREET,

NEW YORK.

HELLER & BARDEL,

MANUFACTURERS OF

DIAMOND JEWELRY,

And Dealers in Diamonds,

No. 13 John Street, New York.

☞ A full line of DIAMONDS, mounted and unmounted; also, a large assortment of first-class DIAMOND MOUNTINGS of our own make always on hand. We will send goods on selection to responsible houses.

Geo. Krementz. J. A. Lebkuecher.

KREMENTZ & CO.,

Manufacturing Jewelers,

No. 13 John Street,

Factory, 361 MULBERRY ST., Newark, N. J.

NEW YORK.

WHITING M'F'G COMPANY,
SILVERSMITHS.

TRADE  MARK

STERLING

WORKS & WAREROOMS,

Broadway & Fourth St., New York.

WHOLESALE ONLY.

DISSOLUTION.

The copartnership heretofore existing between the undersigned, under the firm name of SMITH, HEDGES & CO., is this day dissolved by mutual consent. Any of the partners will sign in liquidation.

ALFRED H. SMITH,
WILLIAM S. HEDGES,
JAMES HEDGES,
HARRISON B. SMITH.

No. 1 MAIDEN LANE, NEW YORK, }
JULY 13th, 1878 }

The undersigned have this day formed a copartnership, under the firm name of ALFRED H. SMITH & CO., *and continuing business as Importers of Diamonds, have removed to No.* 14 *John Street.*

ALFRED H. SMITH.
HARRISON B. SMITH.

New York, July 15*th*, 1878.

The undersigned have this day formed a copartnership, under the firm name of WM. S. HEDGES & CO., *and continuing business as Importers of Diamonds, have removed to No.* 170 *Broadway, corner of Maiden Lane.*

WM S. HEDGES.
JAMES HEDGES.

New York, July 15*th*, 1878.

CARTER, HOWKINS & SLOAN,
Makers of Fine Jewelry

Consisting of Chains, Bracelets, Sets, Pins, Studs, Sleeve Buttons, Rings, &c., in Roman, Etruscan and Enamel.

Whiting Building, Corner Broadway and Fourth Street,

A. CARTER JR.
WM. HOWKINS,
A. K. SLOAN.

NEW YORK.

C. E. HASTINGS,
GEO. R. HOWE,
W. T. CARTER.

Established 1817.

Ve. J. MAGNIN, GUÉDIN & CO.

Manufacturers and Importers,

FINE SWISS WATCHES,
REPEATERS, CHRONOGRAPHS & CALENDARS.
GENEVA GOLD JEWELRY,
FRENCH CLOCKS AND BRONZES,
RICH FANCY GOODS,
HORSE-TIMERS & PODOMETERS,
GOLD AND SILVER CHATELAINE WATCHES.

No. 652 BROADWAY, NEW YORK.

Sole Agents for the James Nardin Watch.
House in Geneva, 14 Grand Quai.

HALE & MULFORD,

MANUFACTURERS OF

RICH JEWELRY,

(WHITING BUILDING),

No. 694 Broadway, corner 4th Street,

NEW YORK.

Stone and Shell Cameo Goods, Rings, Necklaces, Colored and Etruscan Work, Etc.

FIRST CLASS GOODS OF OUR OWN MAKE
EXCLUSIVELY!

BALDWIN, SEXTON & PETERSON

MANUFACTURERS OF

Fine Jewelry,

Diamond and Stone Cameo Goods,

GOLD CHAINS, &c.

Importers of Diamonds, Pearls, Emeralds, Rubies, &c.

WHITING BUILDING,

Cor. Broadway and Fourth Street,

NEW YORK.

OFFICE OF

THE ADAMS & SHAW COMPANY

SILVERSMITHS

694 BROADWAY, NEW YORK

TO THE TRADE.

We beg the favor of your attention to a few facts which we think may be of interest to our friends in the trade, and especially to the large number who have so satisfactorily handled our goods during the past year.

We have greatly enlarged our variety and stock of **Small Silver for Wedding and Holiday Gifts**, and it is conceded that a cleaner stock of desirable goods at satisfactory prices cannot be found in the city.

We call your especial attention to our patterns of **Spoons and Forks**, which are regarded as the most successful in the market.

We are prepared to furnish designs and estimates for Testimonials, both public and private, Military and Long Range Rifle Matches, Race Cups, etc., etc., upon application.

ELECTRO PLATE

We also make the very finest **Hard Metal, Silver-Soldered Plated Ware**, and were the first to discard entirely the use of soft solder in soldering the joints, mounts, etc., and no such weak spot or defect can be found in any piece of ware ever made by us.

We are always happy to answer enquiries relating to our business, and will be pleased if you will favor us with a call when you are in the city.

Very respectfully yours,

THE ADAMS & SHAW COMPANY.

ALFRED H. SMITH & CO.,

OF THE LATE FIRM OF SMITH, HEDGES & CO.

IMPORTERS OF

DIAMONDS

No. 14 John Street.

NEW YORK

☞ *Offer to the Trade recent Importations of carefully selected Goods in all qualities at close figures.*

WHEELER, PARSONS & HAYES,

MANUFACTURERS OF

Watch Cases, Gold Chains & Fine Jewelry,

AND DEALERS IN

AMERICAN AND SWISS WATCHES,

NO. 2 MAIDEN LANE, NEW YORK.

Joseph B. Bowden & Co.

MANUFACTURING JEWELERS,

SOLID GOLD RINGS

A SPECIALTY.

A LARGE ASSORTMENT OF PLAIN, CARVED, PLAIN BAND AND CHILDRENS' ALWAYS ON HAND. ALSO A FULL LINE OF CAMEO SLEEVE BUTTONS AND STONE RINGS.

Old No. 11 Maiden Lane, New York.

ONYX GOODS A SPECIALTY!

JOHN A. RILEY & CO.,

Manufacturing Jewelers,

ETRUSCAN GOLD AND CORAL SETS, ROMAN BRACELETS, NECKLACES, &C.

Nos. 7 and 9 BOND STREET

NEW YORK.

No. 126 Kearny Street, San Francisco, Cal.

Established 1813.

THOMAS G. BROWN,

MANUFACTURER OF

FINE JEWELRY,

NEWARK, N. J.

—AND—

9 BOND STREET, NEW YORK.

MOORE & HORTON,

JEWELERS,

No. 11 Maiden Lane, New York.

SPECIALTIES!

Stone Cameo, Onyx, Amethyst, Topaz and Pearl Rings. Studs, Collar and Sleeve Buttons.

☞Also our new fac-simile of Fine African Diamonds, mounted in Rings, Studs, Pins, Ear-rings, Scarf Pins, Medallions.

W. H. SHEAFER & CO.,

Makers of Fine Jewelry

CONSISTING OF

BRACELETS, SETTS, LOCKETS, PINS, STUDS, SLEEVE BUTTONS, RINGS, &c.

SPECIALTY:—STIFFENED ROMAN BANDS.

No. 908 Chestnut Street, PHILADELPHIA.

Edward Bissinger,

Manufacturer of Jewelry,

And Importer of Diamonds,

192 Broadway,

New York.

ALLING BROS. & CO.

MANUFACTURERS OF

FINE JEWELRY,

Full Line of Roman and Mosaic Goods,

Earrings, Buttons, Studs and Rings.

SPECIALTIES:

ENGRAVED AND ENAMELED BANDS,

CAMEO GOODS.

170 BROADWAY, NEW YORK.

DYER BRAINERD. JOHN W. STEELE.

BRAINERD & STEELE,

MANUFACTURERS OF

Brainerd's Pat. Lockets,





(Patented June 17, 1874.)

These Lockets combine both beauty and strength. They are made of solid 14kt. gold, and the stones used are the finest obtainable in the market. They cost no more than those of the old style, if indeed as much; and the combination of secrecy and durability renders them much more desirable. We make three sizes in four different shapes—round, oval, cushion and oblong square; and also Sleeve Buttons of the same style, containing a concealed box for miniatures, a novelty new to the Trade.

FINE GOLD JEWELRY,

No. 9 Maiden Lane,

NEW YORK.

Ripley, Howland & Co.



MAKERS OF

FINE JEWELRY.



Would respectfully call attention to their patent PLATINUM TIPPED Settings for Diamonds (just introduced), an advantage dealers will readily appreciate, as the stone is held, not by yellow, but by scarcely perceptible *white* points which are equally strong and more durable than gold.

These *white* points impart an elegant appearance to the gem and relieve the setting of that coarse and unattractive look usually found in those entirely composed of silver or platinum.

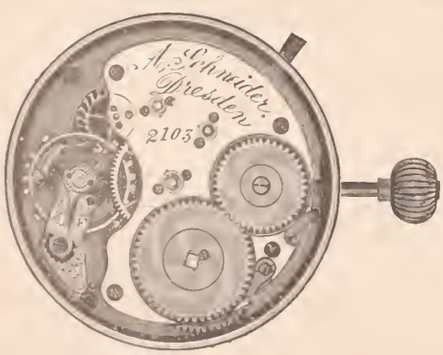
PATENTED APRIL 16th, 1878.

NO. 35 MAIDEN LANE, NEW YORK.

FACTORY, 383 WASHINGTON STREET, BOSTON, MASS.

MAX FREUND & CO.

Manufacturing Jewelers.



IMPORTERS OF

Watches

Jewelry and Precious Stones,

8 Maiden Lane,

NEW YORK.

☞Sole Agents for the Celebrated A. Schneider Watch, Dresden.

MATHEZ

Watch Company,

Of NEW YORK.

Gents' and Ladies' Stem-Winding Movements

STRAIGHT LINE, 3-4 PLATE NICKEL.

These Movements are of six different grades, uniform in size and beautifully finished, and will be SOLD AT LOWER PRICES than any other goods of similar excellence.

☞A FULL LINE of materials for our movements always kept in stock for the convenience of those using our goods.

F. H. MATHEZ, Sole Agent,

No. 5 Maiden Lane, New York.

ENOS RICHARDSON & CO.

MANUFACTURERS OF

FINE GOLD JEWELRY,

Gold Chains, Lockets, Crosses and Necklaces,

COLORED AND ETRUSCAN WORK.

All Goods sold strictly of our own manufacture.

23 MAIDEN LANE, NEW YORK.

ENOS RICHARDSON, L. P. BROWN, F. H. RICHARDSON,
THOS. SLATER, W. P. MELCHER.

Established 1846.

WILLIAM RIKER,

No. 5 Maiden Lane, New York.

Factory, 42 Court Street, Newark N. J.

CHATELLIER & SPENCE,

Manufacturing Jewelers,

652 BROADWAY, NEW YORK.

No. 1129 Chestnut Street, PHILADELPHIA, PA.

No. 12 West Street, BOSTON, MASS.

No. 120 Sutter Street, SAN FRANCISCO, CAL.

CHATTERTON & DODD,

Makers of Fine Jewelry

Consisting of Sets, Pins, Ear-Rings, Lockets, Crosses, Sleeve Buttons, Studs, &c.

No. 19 John Street, New York.

ROMAN, ETRUSCAN AND ENAMEL WORK GENERALLY, SPECIALLY DESIGNED BY US.



Nº 24 DOELEN STRAAT AMSTERDAM, HOLLAND.
Nº 1 GAERTNER PLATZ MUNICH, GERMANY.

☞ *Diamonds loose and mounted sent on approval on receipt of satisfactory reference.*

COE, PINNEO & STEVENS,

MANUFACTURERS OF

LOCKETS,

WHITE ENAMEL STUDS & BUTTONS,

Linen Finished and

FINE JEWELRY,

Old No. 9 Maiden Lane, New York.

J. A. BROWN & CO.

OFFICE AND SALEROOM:
No. 11 Maiden Lane, N. Y.

FACTORY:
No. 104 Eddy St., Providence, R. I.

SOLE MANUFACTURERS OF THE

Ladd Patent Stiffened Gold Watch Cases



For the Movements of the various American Watch Co.'s, Gent's, Ladies' and Boys' sizes, Key and Stem-Winders, and in the following styles, BASCINE, FLAT-BEVEL and MANSARD, (this latter as originally named, modeled and introduced by them) forming the most complete and varied line of elegant Cases ever offered for sale. It is now eleven years since these Watch Cases were introduced to the public, during which period of time they have steadily gained in popular confidence and esteem, as is evinced by the unprecedented fact in the history of the Watch Trade that more than FIFTY THOUSAND of them have been manufactured and sold. Made of thick plates of Gold and Nickel Composition, (this Composition is harder and tougher than any other metal except the gold itself, and suggested the term STIFFENED, originally used by us to designate this important improvement; no other case in the world is made like it;) thoroughly welded together and rolled to the required thickness—they are, while equally handsome—stronger and more durable than the finest Solid Gold Cases of the same thickness of metal, and at ONE-THIRD or ONE-HALF the COST, and with good movements, they make the cheapest, most elegant and serviceable Watches in the market. The critical examination of these goods by the trade and public is invited. **FOR SALE BY JEWELERS GENERALLY.**

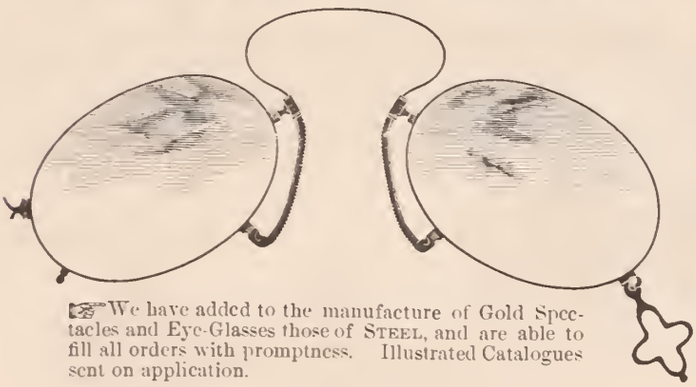
☞Dealers can obtain them of the Wholesale Watch and Jewelry Houses, or their Traveling Agents, throughout the United States and British Provinces.

☞All genuine Watch Cases of our manufacture, have "G. W. Ladd's Patent, June 11th, 1867," stamped upon the side band underneath the glass bezel.

Refuse all others. Send for full Descriptive Circular.

NATHAN E. MORGAN. CHAS. B. HEADLY.

MORGAN & HEADLY,



☞We have added to the manufacture of Gold Spectacles and Eye-Glasses those of STEEL, and are able to fill all orders with promptness. Illustrated Catalogues sent on application.

ARTISAN HALL,

611 & 613 Sansom Street, Philadelphia.

☞A full line of *DIAMONDS*, mounted and unmounted, always on hand, which we will send on approval to the Trade, on receipt of reference.

LOUIS A. SCHERR. CHAS. H. O'BRYON. G. W. SCHERR.

LOUIS A. SCHERR & CO.

Importers and Wholesale Dealers in

Watches, Jewelry,

WATCH MATERIALS, TOOLS, GLASSES, &C.

Spectacles, Silk Guards, &c.

Wholesale Agents for American Watches.

No. 726 CHESTNUT STREET,

FIRST FLOOR,

PHILADELPHIA.

CHARLES GLATZ,

MANUFACTURER OF

Gold and Silver Watch Cases

No. 12 Maiden Lane,

NEW YORK.

A CARD.—After the recent great Improvements to my Cases, I confidently offer them to the Trade, as being without a superior in the market, and so acknowledged by some of the best houses.

E. HOWARD & CO.,

MANUFACTURERS OF

Fine Watches, Regulators, Office Clocks,

Electric Watch Clocks & Tower Clocks,

Office, No. 694 BROADWAY,

Corner Fourth Street, NEW YORK.

No. 114 TREMONT STREET, BOSTON.

J. W. J. PIERSON, - - AGENT.

ESTABLISHED 1855.

D. LIECHTY & CO.,

MANUFACTURERS OF

Fine Gold Watch Cases

No. 140 South Third Street,

Fourth Floor. PHILADELPHIA

Repairing neatly attended to.

Medal and Diploma of Merit
Awarded by Centennial Com.

S. C. JACKSON,

MANUFACTURER OF FINE

CASES

For Jewelry, Silver Ware, Trays, &c.

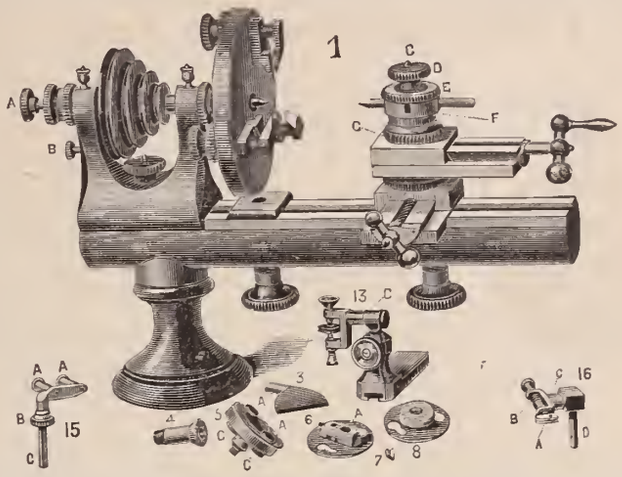
180

BROADWAY,

NEW YORK.



HOPKINS' WATCH TOOL CO.

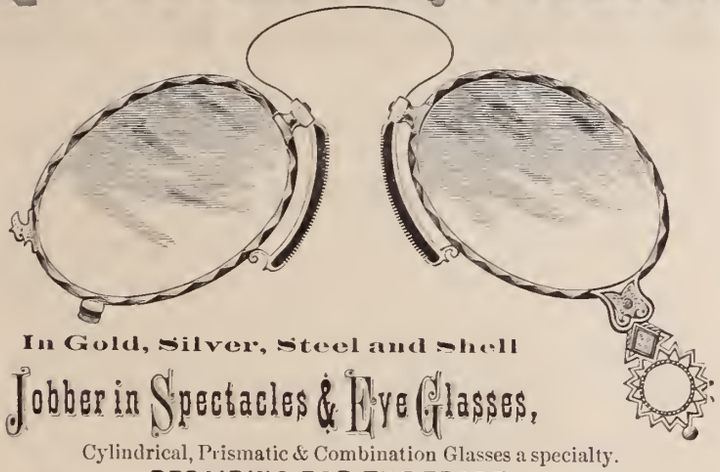


Manufacturers of **HOPKINS' PATENT WATCHMAKERS' TOOLS**, embracing Plain and Combination Lathes, Chucks, Slide and Swing Rests, Gear Cutters, Pivot Polishers, Jeweling and Staking Tools, &c.
Illustrated circulars sent on application.
HOPKINS' WATCH TOOL CO., Waltham, Mass.

WM. J. SUTTIE,

MANUFACTURER OF

Spectacles & Eye Glasses



In Gold, Silver, Steel and Shell

Jobber in Spectacles & Eye Glasses,

Cylindrical, Prismatic & Combination Glasses a specialty.

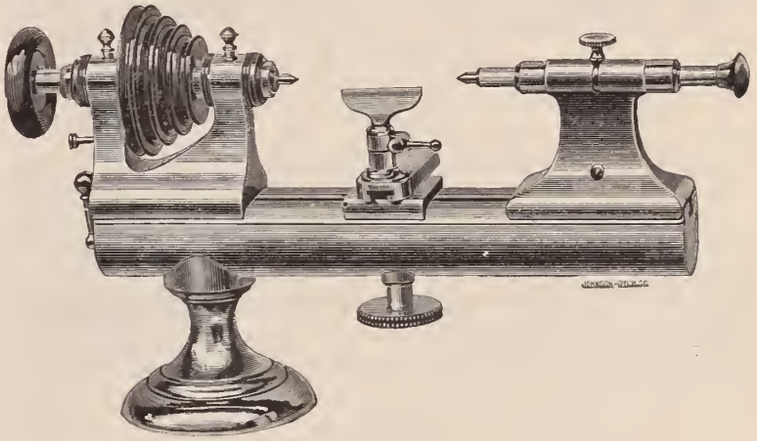
REPAIRING FOR THE TRADE.

No. 39 Maiden Lane, New York.

American Watch Tool Co.

Formerly J. E. WHITCOMB & Co.

Manufacturers of Watch & Chronometer Makers' Tools.



P. O. Box 999.

WALTHAM, MASS

JOS. HOEY & CO.

Engravers on Wood

202 BROADWAY

NEW YORK

REMOVED TO No. 658 BROADWAY.

Max L. Gutmann

Rochester, N. Y.

Importer and Dealer in Watch and Jobbing Materials, Tools, Glasses, Chains, Guards and Jewelry.

GUTMANN'S AUTOMATIC

HAMMER AND PUNCHES



Patented January 8th, 1878.

This Tool takes the place of the third hand, therefore its manifold uses are quickly apparent, and I would only say, that it is accompanied by six punches, to-wit: 1 prick punch, 2 hand punches, 1 closing hole punch, 1 rivet punch, 1 pinion punch, all of which fit neatly into the punch holder, and are fastened by the set screw. Its tap is alternately heavy and light, and the finger loops are assortek in sizes The Tool is nickel-plated and boxed, ready to be mailed.

The operation is as follows: Insert your forefinger through the loop at the top and place the third finger as a guard on the lower end of the barrel, then with the thumb and second finger of the same hand, turn the cam ring which produces the concussion on the punch. This leaves the left hand free to hold the work.

Price, $2.50 Each.

☞Sent by mail, post paid, by the manufacturer, or any first-class Tool Dealer, on receipt of price.

☞Please send your order.

MAX L. GUTMANN, Patentee & Manuf't'r.

Watches and Watch Cases a specialty.

CARROW, CROTHERS & CO.,

MANUFACTURERS OF

FINE JEWELRY,

No. 12 John Street, New York.

Specialties!

FINE LINKED SLEEVE BUTTONS, ROMAN BAND BRACELETS, LOCKETS & CROSSES.

N. B.—We desire to call the attention of the Trade to our IMPROVED BRACELET CATCH, and our new styles of Link Sleeve Buttons.

GEO. W. PRATT. IRA GODDARD.

GEO. W. PRATT & CO.

Manufacturers and Dealers in

American and Swiss Watches

SOLID BAND AND SEAL RINGS.

Gold and Roll-Plated Jewelry.

No. 14 JOHN STREET, NEW YORK.

BOREL & COURVOISIER TO THE FRONT!

SWISS WATCHES

AGAIN RANK AS THE BEST.

IMPROVED MACHINERY HAS DONE THE WORK.

☞We are happy to inform our agents and patrons that the new B. & C. are now ready. ALL ORDERS CAN BE FILLED AT ONCE! We are authorized to make a considerable reduction from former prices, in order to place them within the reach of all.

☞Dealers wishing to act as authorized agents for the sale of these celebrated Watches and Movements will be furnished with full particulars by addressing, with business card,

QUINCHE & KRUGLER,

No. 17 MAIDEN LANE, NEW YORK.

Sole Agents in the United States.

NOAH MITCHELL,

MANUFACTURER OF

Fine Gold Jewelry

CAMEO SETS, ONYX GOODS,

Medallions, Studs, Sleeve Buttons, Rings and Diamond Settings of all Kinds.

DIAMOND SETTING A SPECIALTY.

694 & 696 Broadway, cor 4th St., New York

(WHITING SILVER MF'G CO.'S BUILDING.)

ALL ORDERS PROMPTLY ATTENDED TO.

L. SAUTER,

MANUFACTURER OF FINE

Gold & Hair Jewelry & Device Work,

Nos. 65 & 67 Nassau Street, New York.

Pattern Books containing 300 designs of the most current articles will be sent on receipt of 50 cents, which amount will be returned with the first order.

Orders for Patterns from books of any other manufacturer filled at original prices upon advice of name and number of book.

Patentee and Sole Manufacturer of the

Patent Revolving Rings, the design of which will be found in other pattern books. A complete stock of 14kt.

Solid Jewelry, as Stone Rings, Lockets, Studs, Buttons, etc., constantly on hand, from which I will send for selection to responsible parties.

JOBBING OF EVERY DESCRIPTION.



T. GRANBERY,



Manufacturer of

BLACK ONYX GOODS.



Patented July 16th, 1878.

This Locket is made with double glasses, in numerous shapes and sizes, shows less gold, and is lower priced than any other onyx locket manufactured.

☞ Is especially designed for Ladies' and Gents' Mourning Wear.

☞ **Coral Repairing for the Trade.**

51 Nassau Street, New York.

MANUFACTURERS OF EXCLUSIVELY

BLACK ONYX GOODS,

WOGLOM & MILLER,
32 & 34 JOHN STREET,
NEW YORK.

GEO. B. WHEELER,
NEW BEDFORD, MASS.

MANUFACTURER OF FINE

Watch and Clock Oil.



THE PORPOISE.

☞This Oil is made from the best of stock, is free from gum or corrosion, will stand the coldest weather, and is every way reliable.

L. HAMMEL & CO., Sole Agents,
No. 9 Maiden Lane, New York.
KOCH & CO., Elberfield, Prussia, SOLE AGENTS IN EUROPE.

BOOZ & THOMAS,

MANUFACTURERS OF

Watch Cases & Jewelry,

108 SOUTH EIGHTH STREET,
Second Story, PHILADELPHIA.

Illustrated Catalogues sent upon application.
Old Gold & Silver Bought or Exchanged.
PARTICULAR ATTENTION PAID TO REPAIRING.

TELL A. BEGUELIN,

(Successor to the late GINNEL & BRO.)

Importer of Watches

WATCH MATERIALS, TOOLS AND GLASSES,

No. 71 NASSAU STREET,
(UP STAIRS),
CORNER JOHN STREET NEW YORK.

Sole Importer of the TELL A. BEGUELIN'S BEST MAINSPRINGS.
☞Every description of Watches carefully repaired for the Trade.

HENRY FERA,

Importer of Diamonds,

No. 9 MAIDEN LANE,
New York.

Having my own cutting and polishing establishment at Nos. 23 and 25 Looijersgracht, Amsterdam, Holland, constantly running 36 mills, I am able to offer to the trade a full assortment of Diamonds at very low prices.

Loose and Mounted Goods sent on approval to any part of the country on receipt of satisfactory references.

HAMILTONS & HUNT,

MANUFACTURERS OF

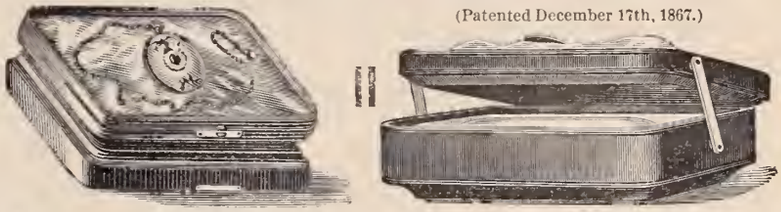
Fine Plated Chains

AND PATENT BUCKLE BRACELETS,

Branch Office, 176 Broadway, New York

FACTORY, 226 EDDY STREET, PROVIDENCE, R. I.

ESTABLISHED 1854. ☞Medal and Diploma Awarded at Centennial Exhibition.
JUDGES' REPORT:—Well made and good patterns—Double Hinge as a useful improvement
(Patented December 17th, 1867.)



G. F. KOLB & SON,

MANUFACTURERS OF FINE

Morocco, Velvet and Cabinet Cases,

FOR JEWELRY, WATCHES & SILVERWARE.
TRAYS FOR SHOW CASES, TRUNKS, &C.
732 Sansom Street, PHILADELPHIA.

Established 1845.

WILLIAM H. BALL,

SUCCESSOR TO

BALL & BARNARD,



Manufacturing Jeweler,

Fine Gold, Enameled and Colored
BRACELETS,
A SPECIALTY!

☞All my Bracelets have the PATENT GUARD at no additional expense, Thus saving the price of chains.

No. 9 JOHN STREET, NEW YORK.
Factory, 30 & 32 Franklin Street, Newark, N. J.

OFFICE OF

ROBBINS & APPLETON,

No. 9 BOND STREET, NEW YORK.

To the Jewelry Trade.

Our attention has been called to a very extraordinary Circular, issued by a certain Watch Case Manufacturer, purporting to set forth certain "unanimous" admissions and agreements supposed to have been made at an "Extra Meeting" of the Jewelers' Association, and to which the signature of the "Waltham Watch Co." is formally attached. We positively assert that no such meeting ever took place, and, furthermore, that the signature of the "Waltham Watch Co." has been used without our authority, and solely for the purpose of misleading the TRADE by a statement deliberately false so far as we are concerned.

ROBBINS & APPLETON.

New York, September 10th, 1878.

American Watch Company.

NEW MODEL MOVEMENTS,

We desire to state that, with a view to improving our Full Plate grades of Move ments, we have entirely remodeled them, with the following special advantages:

1st, The barrel does not project beyond the top plate, thus allowing a plain, tighter-fitting dust band to be used.

2d, The pottance is immovably fixed in the plate, and need never be disturbed. With this pottance so placed it is impossible for the balance to get out of upright, and it is a convenience for repairers. This valuable improvement is secured by patent.

3d, The angles of the pallet jewels, on both sides of the pallet, are the same, and the jewels are interchangeable, which is also convenient for repairers. By this means the whole escapemeat has been improved.

4th, An improved arrangement for letting down the mainspring without taking off the hands and dial. The barrel can be removed by simply taking off he barrel bridge.

5th, All, excepting the "Broadway" and "Sterling" grades, will have machine made conical pivot balance staffs—a great improvement on the hand-made. We shall be ready to put them in the "P. S Bartlett" some time this month, and in the "Ellery" in June.

6th, All the top plate jewels are in settings except in the "Ellery" grade.

7th, The "A., T. & Co." grade is adjusted to heat and cold by new and improved methods.

8th, All grades, including "Broadway" and "Sterling" are warranted

9th, The Stem-Winding and Setting Attachment is simpler, very convenient and more durable.

10th, The dials are firmly secured by screws.

11th, The hair-spring stud is in the cock, so that balance and cock can be taken off and replaced without danger of changing the rate of the watch.

12th, All the wheels and pinions run in the solid plate in jewels or otherwise, the third bridge being abandoned, so that no part of the train can get out of upright.

13th, Balances have mean-time screws—a great advantage in timing and poising when the watch needs repairing.

Finally, the general appearance is much improved by the design and finish of the watch. This is seen at once by comparison with the old models.

Particulars as to prices, etc., will be found on the 4th and 5th pages of our Price List, which will be forwarded on application.

ROBBINS & APPLETON, General Agents,

No. 9 BOND STREET, NEW YORK.

170 State Street, Chicago. 8 Summer Street. Boston. Waltham Building, London.

Dealers in Watches,

Importers of Diamonds.

OPPENHEIMER, BROS. & VEITH,

Manufacturing Jewelers,

35 MAIDEN LANE,

S. Oppenheimer, A. Oppenheimer, **New York.** Henry F. Veith. Gus. F. Veith,

I. PFORZHEIMER. D. KELLER.

PFORZHEIMER & KELLER,

IMPORTERS OF

Watches and Diamonds

Dealers in American Watches,

AND

Manufacturers of Jewelry,

No. 24 JOHN STREET,

P. O. Box 4144. **NEW YORK.**

H. Muhr's Sons, Philadelphia.

MANUFACTURING JEWELERS,

Solid Gold Finger Rings of Every Description



Crown, 18k. Lion.



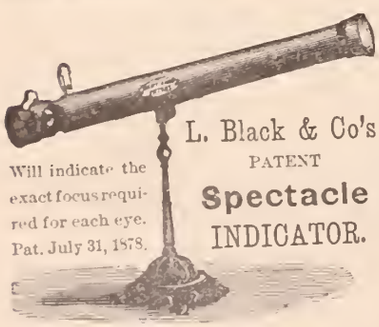
On and after January 1st, 1876, our make of Filled Plain Rings will be stamped as above, which stamp is copy righted. Any and every infringement on the above Trade Mark will be dealt with according to law. ☞Every one warranted.

THESE GOODS ARE SOLD BY ALL THE LEADING JOBBERS!

Should the house that any retailer deals with not have them we will furnish them with the address of the nearest Jobber. ☞SELL TO THE JOBBING TRADE ONLY!

New York Office, 11 Maiden Lane.

☞Address all communications to Philadelphia.



L. Black & Co's PATENT **Spectacle** INDICATOR.

Will indicate the exact focus required for each eye. Pat. July 31, 1878.

L. BLACK & CO.,

MANUFACTURING OPTICIANS,

Detroit, Mich.

We are exclusive manufacturers of a large variety of Spectacles and Eye Glasses, in steel, silver and gold frames. Special attention is directed to our frameless, double vision and interchangeable Spectacles and Eye Glasses. For particulars and price-lists address the above-named firm.

Goldsmith & Schliesser,

(Formerly of Freund, Goldsmith & Co.)

Manufacturing Jewelers,

—AND—

Importers of Watches & Precious Stones,

No. 5 Maiden Lane,

Factory, 56 West 4th Street, **NEW YORK.**

Sole Agents for H. L. Mathey, Locle, Switzerland.

Celluloid Novelty Comp'y,

W. S. SILLCOCKS, President. F. R. LEFFERTS, Sec'y and Treas.



MANUFACTURERS OF

IMITATION

Coral Jewelry.

4 Maiden Lane, New York.

☞Our goods are sold by all the leading jobbers in the country.

E. A. HALDIMANN,

IMPORTER OF

Watches, Watch Materials,

AND OPTICAL GOODS;

Also DEALER IN JEWELRY,

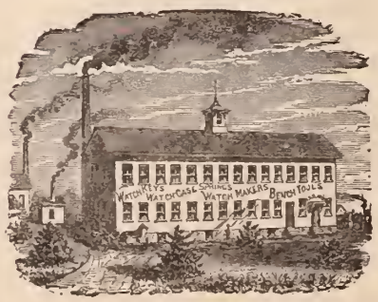
No. 66 Nassau Street, New York.

Country orders solicited. Watch repairing and jewelry jobbing done on the premises, in the best manner, and at reasonable prices.

☞All orders promptly attended to.

A. N. Clark, Plainville, Ct.

MANUFACTURER OF



WATCH KEYS,

WATCH CASE SPRINGS,

Watchmakers' & Jewelers'

BENCH TOOLS.

Crosby's Jeweling Tools, &c.

Sold by Jobbers in Watch Materials and Notions.

☞**Small Articles in Metal Manufactured to order.**

EDWARD TODD & CO.

MANUFACTURERS OF

GOLD PENS,



Pencil Cases, Tooth Picks, &c.

No. 652 BROADWAY,

Factory, 29 & 31 South 11th St., Brooklyn. NEW YORK.

C. F. A. HINRICHS,

29, 31 and 33 PARK PLACE,

Cor. of CHURCH STREET, (Up-stairs) NEW YORK

Successor to M. WERCKMEISTER.

[ESTABLISHED 1801.]

IMPORTER AND DEALER IN

FANCY GOODS,

GLASS-WARE,

China, Bronzes, Clocks, Toys, &c.

Sole Agents for the Glass Factories of the Company "ANN," Namuroise, Belgium

Depot for Archery, Cricket & Base Ball Implements.

And C. A. KLEEMANN'S CELEBRATED GERMAN STUDY LAMPS.

Agent for **ROGER'S GROUPS** in Parian, &c.

ESTABLISHED 1855.

WELCH & MILLER,

MOROCCO, VELVET AND SATIN

JEWELRY CASE MANUFACTURERS.

☞Show Case Trays in Black Walnut and Rosewood.

Velvet Cases for Diamonds a Specialty.

No. 169 BROADWAY, NEW YORK.

CATALOGUES SENT ON APPLICATION.



In placing these Oils before the Trade, we do so with entire confidence, from many years' experience in procuring them from the fish, and in their preparation for use, and more than all, the thorough and SEVERE TESTS they have been subjected to in use upon Chronometers in our whale ships, often absent from fifty or sixty months. ☞Liberal samples furnished on application.

ROSKOPF WATCH.

J. D. HUGUENIN & CO.,

GENERAL AGENTS,

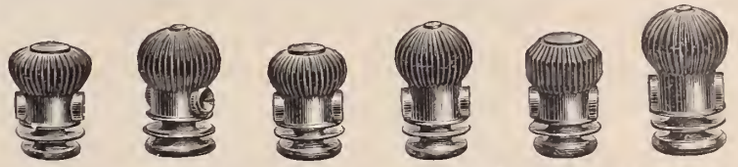
No. 12 Maiden Lane, New York.

The reputation of this Watch as an accurate timekeeper is fully established, and during the ten years that it has been before the Trade, has won an abiding reputation for fine Time-keeping qualities, and the BEST WATCH for the money in the world.

☞Send business card for price list.

MILNE & JOURDAIN,

Manufacturers of Stem-Winding Watch Crowns



13 & 15 Franklin Street, NEWARK, N. J.

Gold Crowns, for Stem-winding Movements, to suit all sizes of Imported or American Watches, in four different styles and seven sizes.

Gold Pushers for Key Movements in every size. Also Gold Crowns for fine Chronograph Watches made to order.

☞Silver Stem winding Crowns and Key Pushers on hand or made to order. Send for card and samples.

A. MILNE. A. JOURDAIN.

BERNARD LEVY,

Manufacturer of Watch Cases

—AND—

JOBBER OF AMERICAN MOVEMENTS,

No. 402 Library Street,

PHILADELPHIA.

ALSO, ORNAMENTAL ENGRAVER AND ENGINE TURNER.

Lubricating Oils, for Watch, Clock and Chronometer Makers.

The discovery of a Lubricator for FINE MACHINERY, such as Watches, Clocks and Chronometers, that is free from gum and corrosive substances, has taxed the ingenuity of hundreds of men whose efforts have proved a failure. But we are happy to say (being largely interested) that such an article has been supplied by MR. EZRA KELLEY, of New Bedford, Mass., who, after forty years study of the subject, has perfected a Lubricator that recomends itself to all who have used the *genuine*, (there having been numerous connterfeits in the market,) as witness also the award of a Diploma and Medal by the judges of the late Centennial Exhibition at Philadelphia. We have no hesitation in saying that his Oils are the BEST manufactured, always uniform in quality and capable of standing all tests applied to lubricating oils. We cheerfully recommend it to all who may in their business require a FIRST-CLASS LUBRICATOR







AMERICAN CLOCK CO., (Hine & Thomas.)

P. S.—The above Oils can be procured at all first-class wholesale Watch and Clock Establishments in the Unit d States, as well as his only Agents, GRIMSHAW & BAXTER, 35 Goswell Street, London England.

New Bedford, October 15, 1877.



☞ "*Medal and Diploma awarded at Centennial Exposition for superior mechanical execution and artistic ornamentation.*"



Established in 1854.

C. & A. PEQUIGNOT,

Manufacturers of Watch Cases.

DEALERS IN AMERICAN WATCHES AND IMPORTERS OF FINE KEY AND STEM-WINDING MOVEMENTS,

Salesroom & Manufactory, 22 South Fifth Street,

PHILADELPHIA.

A full stock of Key and Stem-Winding Gold Cases always on hand. Goods sent on approval when satisfactory references are furnished.

Established 1828.

JACOB BENNETT & SON,

Diamond Setters and Manufacturing Jewelers,

No. 108 SOUTH EIGHTH STREET, PHILADELPHIA.

WE MANUFACTURE AND MAKE A SPECIALTY OF
EVERY DESCRIPTION OF
DIAMOND MOUNTINGS
SUPERIOR IN DESIGN AND WORKMANSHIP.



MASONIC MARKS,
Presentation & Lodge Jewels,
SOCIETY AND POLICE BADGES MADE TO ORDER.
FINE WHOLE PEARL JEWELRY.

GOODS ON SENT MEMORANDUM TO ANY PART OF THE UNITED STATES.

L. & A. MATHEY,

IMPORTERS OF FINE WATCHES AND MOVEMENTS



Removed Feb. 1st, to 16 Maiden Lane.

Independent ¼ Seconds, Minute Repeaters, Minute Chronographs, Plain Chronographs, Double Chronographs, Independent Split Seconds, Perpetual Calendars, Pocket Chronometers.

MINUTE CHRONOGRAPHS, WITH MINUTE REPEATER.
CHRONOGRAPHS, WITH MINUTE REPEATER.
AND A FULL LINE OF MEDIUM GRADE WATCHES AND MOVEMENTS.

Sole Agents for the H. L. MATILE WATCHES.

☞Timing and Complicated Watches a specialty. All our Watches are tried and tested before delivery. ☞Goods sent for examination on satisfactory references.

"TIME AND TIME-KEEPERS," an interestng essay on the rise and progress of Watch-making, sent free to any address on applicaion.





BARTLEYS & RICE,

No. 20 JOHN STREET, NEW YORK.

Importers of Watches,

Watch and Chronometer Makers.

WATCHES OF OUR OWN MAKE.

SOLE AGENTS FOR THE

NICOLE, NIELSEN & CO., LONDON WATCHES, AND FOR THE STAR WATCH COMPANY, GENEVA.

☞ Medals and Diplomas at the International Exhibitions in London '62, Paris '76, Vienna '72, Philadelphia '76.



HALL, ELTON & CO.,

Manufacturers of the Finest Electro-Plated Ware.



The "ORLEANS."

UNSURPASSED IN QUALITY, STYLE AND FINISH!

Factories, Wallingford, Conn. Salesroom, 75 Chambers St., New York.

HOLMES, BOOTH & HAYDENS,

MANUFACTURERS OF

ELECTRO-SILVER PLATED

Spoons, Forks, Ladles, Fancy Pieces,

Solid Handle Steel Knives, &c., of the finest quality.

No. 49 Chambers Street, **NEW YORK.**

No. 18 Federal Street, **BOSTON.**

Works at Waterbury, Conn.

BROWN & BROTHERS,

MANUFACTURERS OF

Finest Quality of Electro-Plated Flat Table Ware.

PATENTED HEAVY SPRING TEMPERED SHANK ON FORKS AND SPOONS.

ILLUSTRATED CATALOGUES FURNISHED ON APPLICATION.

WAREROOMS, No. 81 CHAMBERS STREET, NEW YORK CITY.

FACTORIES, WATERBURY, CONN. P. O. BOX 5731.

JAMES E. SPENCER, President. JOHN S. SPENCER, Treasurer.

Spencer Optical Mf'g Co.

Manufacturers of Optical Lenses.

GOLD, SILVER, STEEL AND NICKEL-PLATED

SPECTACLES.



GOLD, STEEL, RUBBER, CELLULOID AND SHELL EYE-GLASSES.

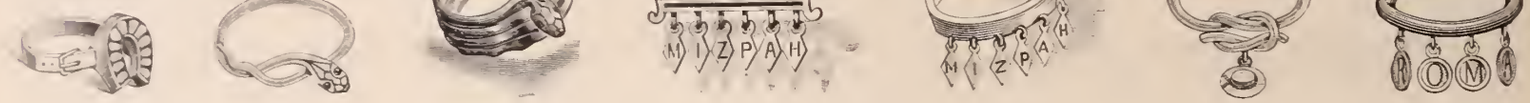
☞ Will send our Catalogue, fully illustrating all goods, to those who have not received it, on application.

FACTORIES, MT. KISKO, N. Y. Office, 13 Maiden Lane, New York.

HENRY C. HASKELL,

MANUFACTURING JEWELER,

No. 12 JOHN STREET, NEW YORK.



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NOVELTIES IN "GIPSY" AND BANGLE RINGS: "Mizpah," "Roma," "Salve," "Bonheur," &c.

New designs in CAMEO, ONYX AND AMETHYST RINGS. *Estimates furnished for* CLASS RINGS, BADGES, &C.

Orders solicited for goods on approval. Stone Seal Engraving and Jobbing of every description promptly and carefully done at lowest prices.

☞ Write for samples Ladies' Crown Rolled Plated Chains, New Styles, "Empress," "Fifth Ave." "Brighton."

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Importers of Fine Swiss Watches,

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NICOUD WATCH

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Factory, 12 Rue St. Pierre, Chaux de Fonds, (Suisse.) Established 1847.



Sole Importers of the { Frederic Nicoud / Fred. Nicoud & Son / Arnold Nicoud / Louis Nicoud } WATCHES.

☞ *All Watches fully Warranted as to quality of Movements and Cases.*

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BROWN & BROS.,

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Manufacture CHEMICALLY PURE COPPER for ALLOYING, and are prepared to fill orders for same, either in the Wire, Strip or Granulated form. Its PURITY has been attested as follows.

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BROWN & BROS.

Dear Sir.—We have analyzed the two samples of Copper left with us on the 18th instant, one said to be foreign refined Copper as used by jewelers, the other a refined Copper as manufactured by you for the same purpose. We find both samples alike in purity, and no difference can be detected by a careful chemical analysis, both being samples of PURE METALLIC COPPER, having no traces of antimony, tin, arsenic, zinc or lead.

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BIRCH'S PATENT

Self-Adjusting Watch Keys.

WILL WIND ANY WATCH.

FOR SALE BY THE TRADE GENERALLY.



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No. 38 Dey Street, New York

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Manufacturers of First-Class Electro-Plate,

No. 690 BROADWAY, near Fourth Street, NEW YORK.

Particular attention is called to the new PATENTED PROCESS OF PLATING, whereby the most exposed parts are plated the heaviest. Also to the new Patented Heavy Spring Tempered Shanks on Forks and Spoons.

☞ *Price Lists mailed on receipt of application, enclosing business card.*

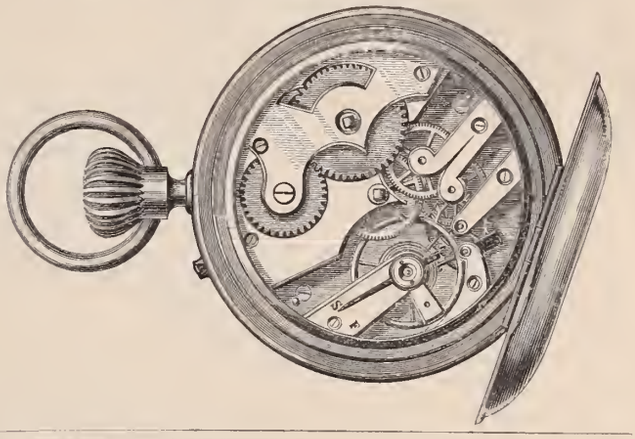
CROSS & BEGUELIN,

Makers and Importers of SWISS WATCHES,

AND DIRECT IMPORTERS OF

Watch Tools, Materials, Glasses, &c.

No. 21 Maiden Lane, New York.



The CENTENNIAL WATCH (Stem-Winding and Stem-Setting) so universally popular, has achieved a standard reputation, and is generally conceded to be the best made watch for the money in this market. Being the sole manufacturers of this celebrated Timekeeper, we are enabled to give it our strongest endorsement. Especial attention is called to the "HENRY BEGUELIN," "DROZ & PERRET," and other well known Swiss Watches, as well as to our full and complete line of all grades of American Watches, on which we give the full trade discount.

☞ The attention of Watchmakers is directed to our new DRILLS, in sets of 21 sizes. The most complete and serviceable drill ever offered.

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Importer of Watches,

From his own Factory, Chaux de Fonds, Switzerland.

No. 25 JOHN STREET,

Leon L. Gallet,
Charles Perret,
Jules Racine.

NEW YORK.

HENRY HIRSH. EDWARD HIRSH.

HIRSH BROTHERS,

Dealers in Watches & Diamonds

AND MANUFACTURERS OF

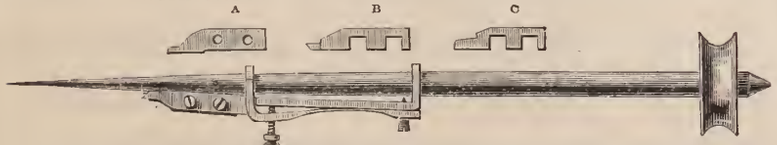
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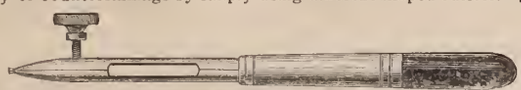
☞ Prompt attention given to filling orders for all kinds of goods pertaining to the trade.

Schwerter's Patent Adjustable Jewel Setting and Counter Sinking Drill.

WITH GROOVED ARBOR AND IMPROVED CUTTERS.



This tool will enable any watchmaker of ordinary skill to do a good jeweling job, and in some cases in less time than it could be done with a lathe. The tool can also be used to make a variety of countersinkings by simply using different shaped cutters. **Price $6.**



This Cut represents **Schwerter's Patent Jewel Setting Opener,** a very handy tool, which will in almost every instance open a closed jewel bezel without injuring it. **rice $1.25.**

On receipt of Price these tools will be promptly forwarded to any address.

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☞ A liberal discount will be made to dealers on orders of not less than ½ Dozen.

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Manufacturer & Importer of Fine Swiss Watches,



SOLE IMPORTER OF THE

AUGUSTE SALTZMAN
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The Trade is respectfully notified to beware of imitations of the name of Saltzman, marked on Watches of an inferior grade, and purporting to be the genuine Saltzman.

No. 15 Maiden Lane, New York.

TIFFANY & Co.

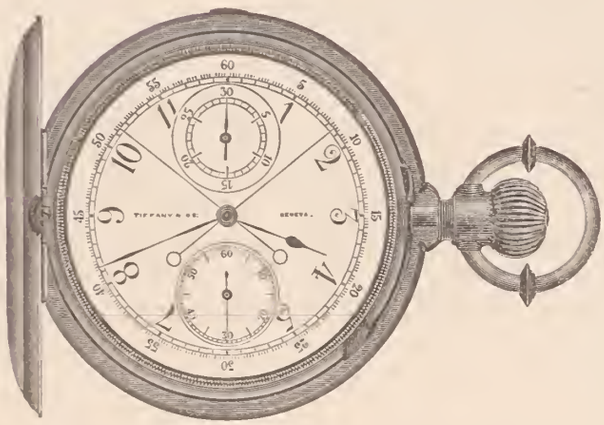
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MAKERS OF

FINE AND COMPLICATED WATCHES

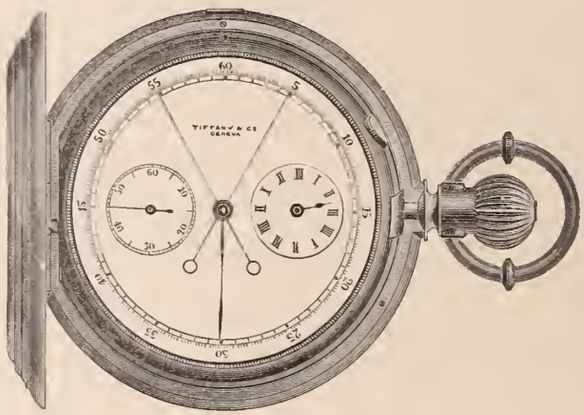
Wholesale Office, 14 John Street, New York.

GEO. R. COLLIS, Manager.



Independent Minute and Second Chronograph.

SINGLE AND SPLIT SECONDS.



Split Second Chronograph.

OUR stock consists of the STANDARD TIFFANY WATCHES with three-quarter plate (patent and plain regulator); *Bridge Movement Watches*, finely adjusted; the largest and most varied assortment of FINE COMPLICATED WATCHES ever imported, embracing the celebrated TIFFANY CHRONOGRAPHS (fly backs), single and split seconds, marking fifth of a second, generally used as the most reliable for timing and scientific requirements.

REPEATERS, striking hours, quarters and minutes. REPEATERS, striking hours and five minutes. CALENDAR Watches showing on the dial the month, day of the month and week, and changes of the moon. CHRONOGRAPHS and REPEATERS combined, and many others never before imported.

Our LADIES' WATCHES are of all sizes, beautifully cased in 18kt. Gold, plain (red or yellow), Engine-turned, Carved, Enameled, Jeweled, Inlaid, in Hunting, half-Hunting, Open-Face, Flat, Knurl-edge, Louis XIV., XV., XVI., Jurgensen and Frodsham styles.

Each and every movement is finished under our own supervision, by thoroughly skilled hand labor, and finely adjusted to temperature and positions. After being cased they are submitted to severe adjustment tests for at least thirty days, and then guaranteed by us to be "as fine time-keepers to carry as are made."

All TIFFANY Movements are Stem-Winding, fully jeweled, made of nickel, artistically finished and ornamented.

ALL Watches of our make have the firm name "TIFFANY & Co." engraved upon the movements, and the trade are cautioned against apparent fac-similies put upon the market by certain *unscrupulous* dealers. The TIFFANY Watches are cased in 18 KARAT GOLD, have an established *retail* price, and we *positively* refuse further supplies to anyone underselling them.

☞ *Goods sent for selection or examination on receipt of satisfactory references. Orders for engraving, ornamenting or refinishing nickel movements, and engraving inscriptions, devices, and monograms on cases promptly attended to.*

☞ *Also General Agents for Messrs.* PATEK, PHILIPPE & Co., *Geneva, Switzerland, a full line of whose watches will be found at our store and offices*

SPECIAL NOTICE.

FANCY GOOD DEPARTMENT!

Season of 1878.

The very gratifying and practical form of commendation extended last season, by the trade throughout the country, to our new and extensive stock of goods then exhibited, has encouraged us to make an increased and special effort this season to exhibit in this department of our business the most complete and varied stock it is possible to find—consisting of all the **latest novelties** *of the Paris and Vienna market.*

FRENCH CLOCKS,

(The establishing of which, in Europe, we have made a specialty for over thirty years,)

IN EVERY VARIETY AND AT ALL PRICES.

ARTISTIC POTTERIES AND BRIC-A-BRAC OF RARE DESIGNS,

Bronzes, Traveling Clocks, Mirrors, &c.

☞ *We are exclusively a wholesale house and our up-stairs warerooms are intended for the use of the jobbing trade.*

TAYLOR & BROTHER,

No. 676 BROADWAY, NEW YORK.

OPPOSITE GRAND CENTRAL HOTEL.

SOLE AGENTS JACQUES LE COULTRE RAZORS.

MANTEL CLOCKS,
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LE BOUTILLIER & CO.,

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THE ATTENTION OF BUYERS IS DIRECTED TO OUR FALL IMPORTATIONS OF THE ABOVE GOODS, EMBRACING MANY NOVELTIES NEVER BEFORE OFFERED.

GONG CLOCKS, FROM EIGHTEEN DOLLARS UPWARDS.

FALL IMPORTATIONS.

Hall, Nicoll & Granbery,

20 & 22 JOHN STREET, NEW YORK.

Successors to SCHUYLER, HARTLEY & GRAHAM,

In the Fancy Goods and Jewelry Department.

CLOCKS AND BRONZES.

ONE of the firm having been abroad for the purpose of selecting new goods, gave his special attention to this important branch and has succeeded in collecting one of the best assortments of MARBLE CLOCKS, CLOCK TOPS, VASES, FIGURES, CENTERPIECES, CANDELABRA, GROUPS and SINGLE PIECES of BRONZE and IMITATION BRONZE that has ever been exhibited. The assortment is complete from the most moderate prices, which are still elegant in design, to the finest sets imported.

POLISHED BRASS GOODS, PORCELAIN AND FAIENCES.

The variety in these commodities is very extensive and comprising SCONCES, CANDELABRA, CLOCKS, CANDLESTICKS, PLAQUES, VASES, PITCHERS, INKSTANDS. Articles for Table use. Ornaments for wall, Painted Panels for picture or screen, Match Stands, Cigar Holders, &c.

Folding Triplicate Mirrors.

These Mirrors have proved to be very useful, are very ornamental, and the most saleable article for the price that has been introduced. They are in frames of bamboo, gilt, ebony, and other hard woods, and covered with Japanese drawings on paper, embroidery and painting on silk, etc.

☞ Particular attention is called to the following, all newly selected, of which there are a large stock and full lines of, viz :

FANS, OPERA & FIELD GLASSES, TRAVELING CLOCKS, VIENNA GILT GOODS, ODOR BOXES, TRAVELING BAGS, DRESSING CASES, IVORY BRUSHES, WRITING DESKS, PORTEMONNAIE, SHELL JEWELRY, GLOVE AND HANDKERCHIEF BOXES, JEWEL CASES, TABLE & POCKET CUTLERY, FANCY LEATHER GOODS.

WATCHES AND JEWELRY.

☞ PATEK, PHILLIPE & Co., and J. ALFRED JURGENSEN WATCHES *at very low prices.*

Dealers will find it to their advantage to inspect our stock which is one of the most complete in the city.

NEW YORK, April 15th, 1878.

MESSRS HALL, NICOLL & GRANBERY having purchased the business of our *Fancy Goods Department* we respectfully request that the patronage heretofore accorded to us be extended to them as our successors in this branch of our business.

SCHUYLER, HARTLEY & GRAHAM.

The Dueber Watch Case Factory,

NEWPORT, KY.



At the Jewelers' Convention, recently held in New York, it was unanimously admitted by Manufacturers and Jobbers present, that the Dueber Watch Cases, manufactured by the Dueber Watch Case Manufacturing Co., are the best made in the United States.

The Dueber Watch Case M'fg Co.

CINCINNATI AND CHICAGO.

THE WATCH CONTROVERSY.

To the Editor of the JEWELERS' CIRCULAR:

SIR:—When I undertook to reply to some of the misstatements of Mr. Albert H. Potter, I was not aware that I should arouse the ire of so important an institution as the "Watch Importers' Association of New York." This Association, which, with no disrespect, but for brevity, I shall hereafter refer to as the "W. I. A. of N. Y." has, in a long and dreary article, seen fit to reiterate Mr. Potter's misstatements and add a few more on its own account.

I will not impose upon your good nature nor intrude upon your valuable space by wading through the whole of their article; but, out of the immense amount of chaff select what little there is of wheat. As far as the gentlemen who compose this Association can find entertainment in playing upon my name and harping on "brains," they are welcome. I had nothing to do with making my name; and as I received it I had to transmit it honorably to my children. While as for "brains," if the "W. I. A. of N. Y." is to be judged by the article before me, a little of that article might be judiciously distributed among its members. But with making watches I have had something to do, and as watches are the subject at issue, I do not propose to be diverted from that issue by any cheap attempts at wit.

I think, Mr. Editor, we can save time by a brief reference to the subject under discussion. During our great International Centennial Exhibition, among the number of distinguished foreigners who visited our shores was a Mr. Edouard Favre-Perret, who also came in an official capacity. As his business was the manufacture of watches, it is fair to infer that what he saw at the Exhibition, with regard to American watches, must have impressed him favorably, for he was induced to travel some distance out of his way to view the great factory at Waltham, Mass. What he saw there, and how he was affected by what he saw, he himself has told in a speech at Chaux-de-Fonds, Switzerland. Those who are really acquainted with the factories in Switzerland in comparison with those in this country will readily understand how the pre-eminent superiority of the Waltham must have astounded Mr. Favre-Perret. The exquisite machinery, the rapidity and accuracy of construction, the perfect finish, the cleanliness and discipline, and, finally, the result—a finished watch. He bought a watch; not a fine one, but one of the fifth grade, rightly judging that if the lowest grade performed well the highest must do better. On his return to Paris he tests his watch by a regulator, and found that in six days it varied thirty-two seconds. He showed it to one of his first adjusters at Locle, who asked permission to take it to pieces, which he finally allowed him to do. In a few days the watch was returned to him with these words: "I am completely overwhelmed; the result is incredible; one would not find such a watch among fifty thousand of our manufacture." Bursting with these facts, like a "pent-up Utica," he made his speech, since become famous, at Chaux-de-Fonds, which carried consternation to his listeners and eventually to the Swiss importers in New York. In the fullness of his heart he spoke, and what he said carried conviction with it—for what he saw was *true*. They knew things had been going wrong for some time, and Mr. Favre-Perret told them *why*. Two hundred and thirty-two thousand watches exported to the United States *less* than in 1872. Add to this the effect Mr. Favre-Perret's speech was making throughout the world, and things were bad indeed. No wonder the Swiss manufacturers were aghast, and their New York agents trembling at the prospect of diminished commissions. To add to their consternation the American companies were not idle. With a laudable eye to business, and with admirable tact, they availed themselves of Mr. Favre-Perret's speech to circulate their wares. So, turn where they would, the members of the W. I. A. of N. Y. were sure to encounter a Waltham watch. With it the railroad conductor started his car, and by it the bank president closed his labors for the day. And even the physician, as with one hand he felt their feverish throbbing pulses, in the other he was sure to hold a Waltham watch. Still, all was not yet lost; there was still for the horse jockey the "montre soignée,"—I beg pardon, the "montre compliquée." But, alas, this reprieve is destined to be of short duration, for soon the Elgin as well as the Waltham are about to add, among other improvements, the chronograph to their watch. No wonder every effort was made to induce Mr. Favre-Perret to modify his speech—to make him say he did not mean to say what he did say.

Among the letters addressed to Mr. Favre-Perret on the subject was one from a Mr. Potter, "*who is endorsed by a leading Philadelphia house as as fine a workman as you can find in this or any other country.*" Now, mark the ingenuousness of the W. I. A. of N. Y.: they say, "Mr. Potter's letter was a private one, written, as he declares, purely in defense of the truth, and not intended for publication. By a happy chance it recently came in possession of '*our*' Association, who promptly gave it to the public. It has been translated into French and German for foreign publication."

Here is a private letter teeming with misstatements, not to say worse, which the innocent scribe of the W. I. A. of N. Y. would have us believe was not intended for publication. Pray then, how did it get into print? Did Mr. Favre-Perret publish it? Why, every line of it bears the internal mark of its having been written for the public. And, with what avidity it is pounced upon by the W. I. A. of N. Y., who hasten to circulate it in three languages, while in the same breath they denounce the American watch companies for giving circulation to a spontaneous tribute rendered to their skill and enterprise, unsolicited by them, and that too by a foreigner, perfectly disinterested, whose sense of truth and justice are so strong as to outweigh all personal considerations.

"To these just criticisms (in Mr. Potter's letter) Mr Favre-Perret has made no reply." For innocence could anything equal this! Reply, indeed. I should think not. Mr. Potter's letter was an insult. Besides its unblushing misstatements and groundless assersions it contained a covert insinuation that he had been paid to make his speech. And besides, Mr. Favre-Perret had just returned from the United States, where he had seen with his own eyes what was the condition of watch manufacture there. He was in Switzerland *then*, and could judge for himself what was the condition of watchmaking there. But Mr. Potter would instruct Mr. Favre-Perret on the condition of watchmaking both here and there.—"Had he not gone to Switzerland to learn how to make a better watch?" etc. But if Mr. Favre-Perret did not answer Mr. Potter, he in a letter to the *Journal du Locle*, Switzerland, "*exposes the mistranslations* of the American version of his speech, and explains his meaning, without denying any point on taken by Mr. Potter." The American translator, instead of rendering the word "*soignee*" as referring to highly finished watches, translated it *complicated*, as referring to complicated watches. To whatever grains of comfort they can gather from this, they are heartily welcome. But on so slight an error as this, to characterize the whole translation of Mr. Favre-Perret's speech as garbled and untruthful is only in keeping with the want of fairness of the anonymous scribblers who have attacked it. That the Americans *can* supply the demand of their markets is becoming so confirmed every day, that even the W. I. A. of N. Y. cannot fail to see it. And as for the "*montre soignee*," and the "*montre compliquee*," the Swiss will remain "the masters" just so long as they form an unimportant part of the watch industry of the United States. But when the demand shall become sufficient to attract the attention of the American watch companies, that class of watch will follow the others, all the efforts of the Swiss manufacturers abroad and the W. I. A. of N. Y. at home to the contrary notwithstanding.

And now, one word more for Mr. Potter, and I trust I have done with him forever. He is the self-constituted champion of Swiss watches, and has been accepted as such by the Swiss importers of New York. In an impertinent letter to a gentleman conspicuous for the high position he occupies in his profession, a letter filled with false statements and unsupported assertions, he calls upon him to stultify himself by contradicting a speech which was the result of careful investigations and confirmed by facts. One of the strong points of Mr. Potter, as well as the Swiss importers, is the advertising, "*patent quack medicine style*," with which he and they charge their competitors. In a card now before me, signed by Mr. Potter, he informs the public that he is the proprietor of a watch, his own make, which he offers for sale, which he "*claims to be the very best in the world.*" His reasons in support of this very modest claim it is not necessary to notice; but it is very apparent to every one else as it was to Mr. Favre-Perret, that Mr. Potter in addressing Mr. Favre-Perret was seeking to advertise Mr. Albert H. Potter and the "*very best watch in the world.*" Mr. Favre-Perret declined to be made use of in that way, and the result was that the "private letter," "written purely in defence of the truth," was printed in three languages by the W. I. A. of N. Y., and Mr. Albert H. Potter and "*the very best watch in the world*" was pretty well advertised everywhere. This transaction, while it speaks well for the shrewdness of Mr. Potter, does not say much for the *brains* of the W. I. A. of N. Y.

Consistency is not among the virtues of the W. I. A. of N. Y. They whine over a duty of twenty-five per cent. on foreign watches, which they term "onerous" and "oppressive," and which prevents fair competition, while at the same time they boast the incalculable advantage of two hundred years of "*inherited experience*," and that, for "*five francs or thereabouts*," as much skilled labor can be got in Switzerland as can be got in this country for five dollars Where the hardship to foreign manufacturers comes in I cannot see; but American legislators have too much *brains* not to see what is necessary under such circumstances to foster a useful home industry.

In the same spirit they tell us that an American watch which keeps *excellent* time when new, will lose its accuracy after a few years, and become worthless as an accurate timekeeper, while its "Swiss competitor" of the same grade will improve with and for years. If there is so much room for improvement for years in the future for the "Swiss competitor," how can it be a good watch at the present? And how many years must it be in a progressive state before it arrives at the point of keeping *excellent time* like the American watch? It will require some *brains* on the part of the W. I. A. of N. Y. to reconcile these contradictions; but the average watch buyer in this country has *brains* enough not to be long in making up his mind which of the watches he will choose.

But, Mr. Editor, it would be a thankless task and a waste of time to point out all the inconsistencies and contradictions in the manifesto of the W. I. A. of N. Y., and I will conclude with one more remark. They tell us they do not object to *honorable competition*, and if this controversy is to be continued they will oppose "facts" to the claims of their competitors. We hail this announcement with a pleasure not experienced at any other part of their long manifesto. And among their "facts" we would suggest that they tell us all about the skill of the Swiss manufacturers in counterfeiting watches of other nationalities.

How Frodsham chronometers and M. J. Tobias levers have been sent forth by the bushel. And how every market is flooded with worthless Swiss imitations of watches purporting to be of Waltham manufacture. How a few years ago eleven hundred of these fraudulent imitations were seized on their way through the Custom House, and a search through Maiden Lane revealed the fact that many Swiss importers were engaged in this nefarious traffic. If American watches have "gained no foothold whatever on the Continent of Europe," as asserted by the W. I. A. of N. Y., though it is by no means certain that it is so, *this* may explain the reason why. It is well known that where counterfeits prevail the genuine suffers accordingly. But if this is their *honorable* competition, I'll none of it.

LOUIS C. GROPPENGEISSER. 131 S. 13th St., Phila.

Vulcanite Jewelry Co.

MANUFACTURERS OF

WHITBY JET,

Combination Whitby Jet and Vulcanite,

Byron's Patent, May 18, 1869.

Also a full line of Lockets—plain, gold mounted and monogram.

No. 191 BROADWAY, N. Y.

☞ Agents for the NEW RUBBER WATCH CASES, Fitting all American Movements.

CHARLES KNAPP,

Engraver, Diesinker and Stamper

FOR JEWELRY PURPOSES.

Manufacturer of Shanks and Heads for Seal and Diamond Rings.

Sample Cards always on hand.

☞ Superior Carved and Fancy Band and Children's Rings, with very elaborate designs, a Specialty.

☞ Fine Engraving and Enameling Work done.

41 Maiden Lane, N. Y.

DAVID PRINCE,

Gold and Silver Refiner,

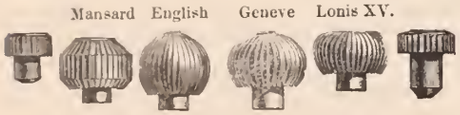
Assayer and Sweep Smelter,

63 RAILROAD AVENUE,

NEWARK, N. J.

Sole Agent for Comins' Improved Amalgamators

Mansard English Geneve Louis XV.



HENRY LEFORT,

Stem-Winding Watch Crown Manufacturer,

Crowns and Pushers in gold, all sizes, quality and color, made to order. Silver crowns and pushers always on hand.

☞ Samples sent on application.

80 & 82 Marshall Street,

NEWARK, N. J.

HENRY ZIMMERN,

IMPORTER OF

Watch Materials,

TOOLS, GLASSES, SILK GUARDS,

Spectacles & Eye Glasses,

No. 8 Maiden Lane, N.Y,

FIRST FLOOR,

Sole Importer of the A. Hugenin & Gravier Mainsprings

Solid Gold Rings.

TO THE TRADE

For the past twenty seven years I have made the manufacture of PLAIN GOLD RINGS a Specialty, and have given to every branch of the business my personal attention. I am, therefore, able to sell at the LOWEST CASH PRICES, and in every case guarantee the quality. I will send to any address, with proper reference, from 50 to 500 dwts, net cash, the goods to be returned if not found satisfactory. I also make Children's Rings, Silver Rings and Half-round Chased Rings. For uniformity, and the convenience of my customers, Allen's U. S. Gauge has been adopted as the standard in my manufactory. Parties desiring Single Rings can have them forwarded upon payment of 25 cents extra. Orders for all other jewelry filled at the Lowest Cash Prices. Old Gold received and refined, and $1.03 in gold allowed per pennyweight. Yours respectfully,

J. R. WOOD, Office, 14 John St. N. Y.

Particular attention paid to Remounting. Price list furnished on application.



Full line of new and original mountings on hand.

CHAS. F. WOOD,

169 & 171 BROADWAY

NEW YORK

Engraver, Incruster of Precious Stones

And DIAMOND SETTER.

Incrusted Goods a specialty.

All kinds of Lapidary Work promptly executed.

Leon Jeanne. Paul Jeanne.

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MANUFACTURERS OF

DIAMOND MOUNTINGS

And RICH JEWELRY,

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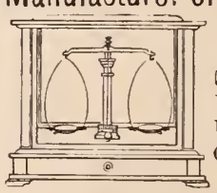
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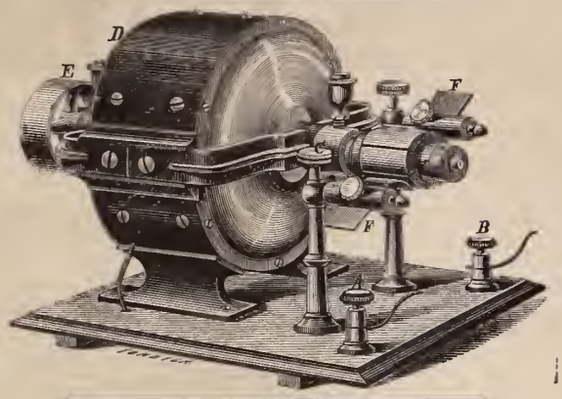
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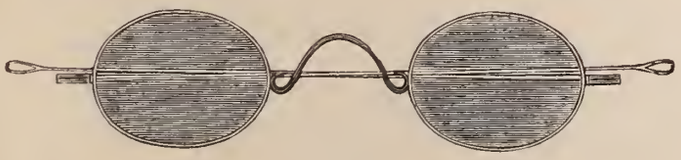
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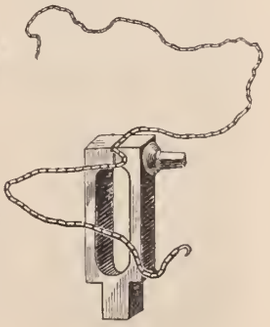
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Bissinger, Philip—Importer of Diamonds, Pearls and Precious Stones. Agent for the Bohemian Garnet Goods No 22 John St., N.Y.

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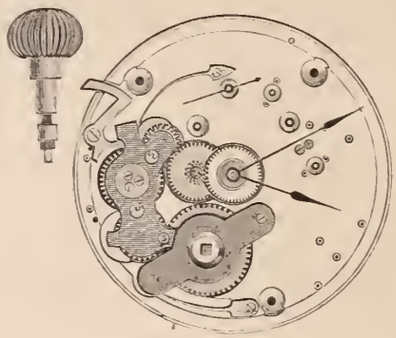
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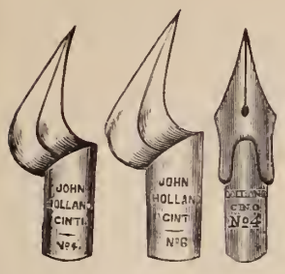
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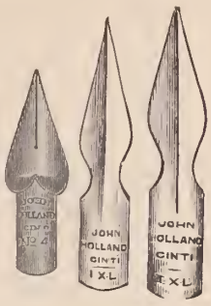
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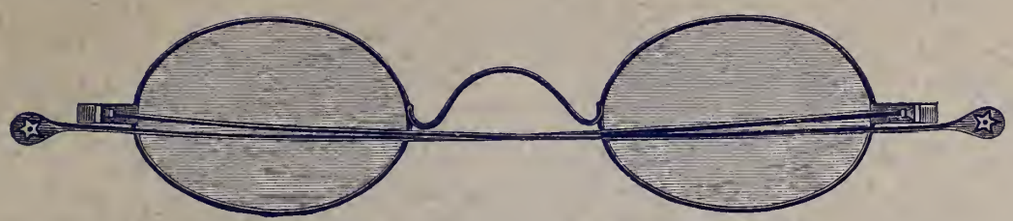
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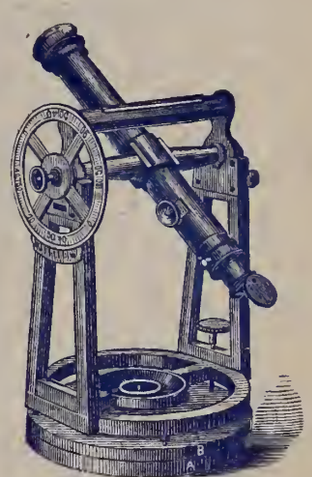
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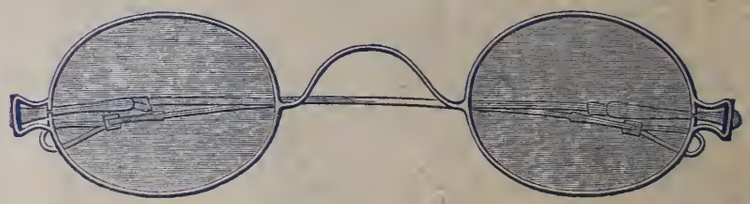
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Also Latest Novelties in Fine WATCHES & JEWELRY.

PRICES REDUCED TO SPECIE BASIS.

☞ I would call especial attention that with the above Spectacles and Eye Glasses it is only necessary to have one complete assortment of the different kinds of lenses, which being of uniform size, will interchange in all the different kinds of frames, thus giving a complete assortment for a comparatively small outlay

ALBERT LORSCH, 37 Maiden Lane, New York.

LORSCH BROS., 120 Sutter St., San Francisco, Cal.

L. LELONG & BROTHER,

GOLD & SILVER REFINERS,

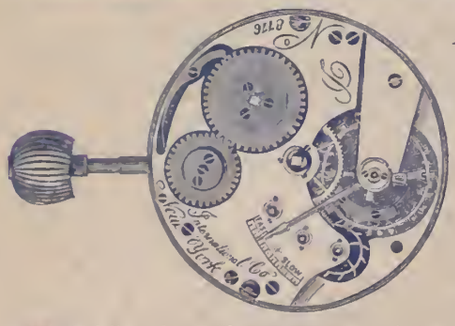
Assayers and Sweep Smelters,

S. W. Cor. Halsey & Marshall Streets,

NEWARK, N. J.

SWEEPINGS A SPECIALTY.

KELLER & UNTERMEYER,



AUTHORIZED AGENTS FOR THE SALE OF THE

INTERNATIONAL

WATCH CO.'S

WATCHES.

☞ A full and complete assortment of these goods in new and attractive Cases constantly on hand.

No. 18 John Street, New York.

L. & M. KAHN,

IMPORTERS OF

Sole Agents for James Kahn, E. Bourquin & Fils AND Alphonse Matile WATCHES.

WATCHES

112 Kearny St. San Francisco, CALIFORNIA.

5 Rue des Alpes, Geneva, SWITZERLAND.

No. 10 MAIDEN LANE,

NEW YORK.

☞ *Manufacturers of the* EAGLE TIMER! *the Best in the market.*

C. Sleeper 25 Park Place

Volume IX. No. 9.

OCTOBER, 1878.

THE JEWELERS CIRCULAR.



D. F. HOPKINSON, PUBLISHER.

42 NASSAU STREET, NEW YORK.

American Clock Co.

581 BROADWAY, NEW YORK.

REGULATOR No. 10.



No. 172 State Street, Chicago.
No. 7 Montgomery St., San Francisco.

SOLE AGENTS IN AMERICA FOR

E. N. Welch M'f'g Co. **New Haven Clock Co.**

Seth Thomas Clock Co. **Welch, Spring & Co**

Seth Thomas, Sons & Co.

A. S. Hotchkiss' Tower Clocks,

(Made by the Seth Thomas Clock Co.)

A NEW SETH THOMAS

REGULATOR.

14 Inch Dial. Engraved and Silvered.

8 Day Time Weight. 68 Inches High. 21 Inches Wide. 9 Inches Deep.

The Seth Thomas Clocks are to be seen at the Paris Exposition, and are in care of Mr. Louis Ritz.

SETH THOMAS.

"NUTMEG" LEVER,
Front. Back.





30 Hour Nutmeg, Brass.
30 Hour Nutmeg, Nickel.

A Small Lever Time-piece
WINDS, SETS AND REGULATES
AT THE BACK.
HANGS UP OR STANDS UP.
WINDER ATTACHED TO CLOCK.

Scale, One-Quarter Size, 3 inch Dial.

"NUTMEG," ALARM LEVER.
Front. Back.





30 Hour Nutmeg Alarm, Brass.
30 Hour Nutmeg Alarm, Nickel.

AMERICAN CLOCK CO., (Hine & Thomas.)

Ansonia Clock Company,

MANUFACTURERS OF AMERICAN CLOCKS,

And IMPORTERS of CLOCKS of EVERY DESCRIPTION.

SALESROOMS: 19 & 21 CLIFF STREET, and 5 CORTLANDT STREET, (Near Broadway **NEW YORK.**

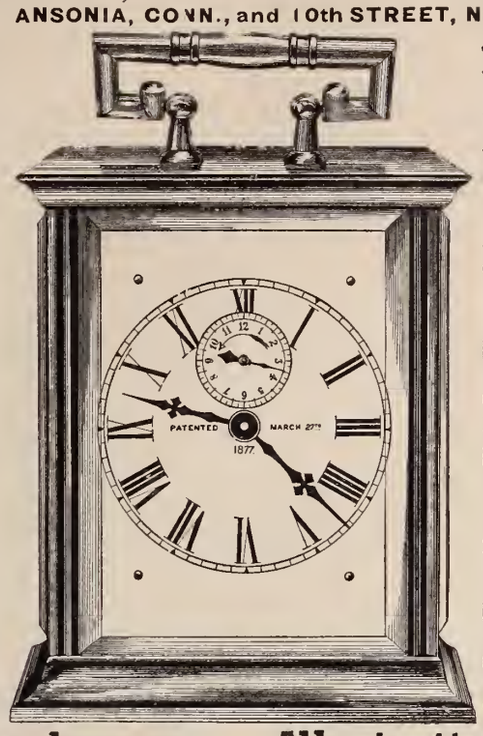
FACTORIES ANSONIA, CONN., and 10th STREET, NEW YORK.



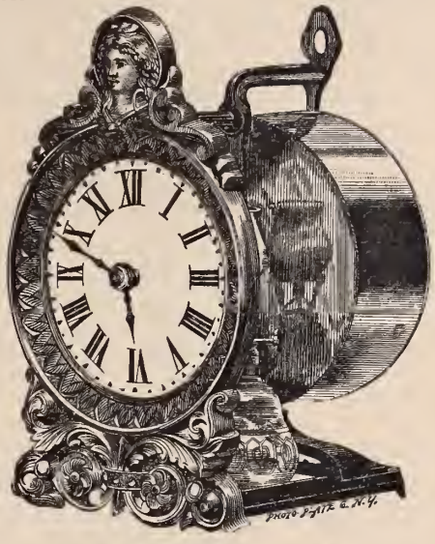
Peep O'Day Alarm.

One-half the size: Stem-Winding: Sets the alarm and winds at the back. "Only requires one spring" to be wound, and will go in any position.

NICKEL OR GILT. CARRIAGE. STEM-WINDER.



One Day Time, Alarm. Eight Day Time. Only one spring to wind.
No. 1, height, 5½ in. No. 2, height, 4½ in. No. 3, height 3½ in.



Aladdin Night Light, Extra.

Nickel and Gilt. Stem-Winder. Patented November 1, 1877. One Day Time. Four inch dial. Height, 7 inches.

The above are excellent Time-keepers. Illustrations and prices on application.

A NEW LINE OF NOVELTIES WILL SHORTLY BE OFFERED.

Waterbury Clock Comp'y

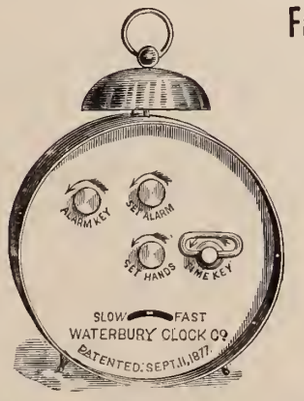
MANUFACTURERS OF AMERICAN CLOCKS,

No. 4 Cortlandt Street, New York. No. 197 State Street, Chicago.

Factories, - Waterbury, Conn.

M. BAILEY, Treas.





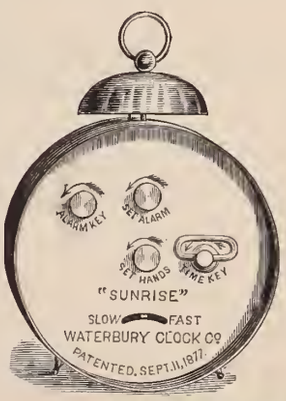
"MONITOR."

30 Hour Lever Time, Alarm Calendar.



"CRICKET."

30 Hour Lever Time.



"SUNRISE."

30 Hour Lever Time, Alarm.



☞ **Are Stem-Winders, No Keys Required, Reliable Time-Keepers, Will Run in any Position, Separate Alarm Spring, Set and Regulate at the Back. Nickel-Plated Cases.**

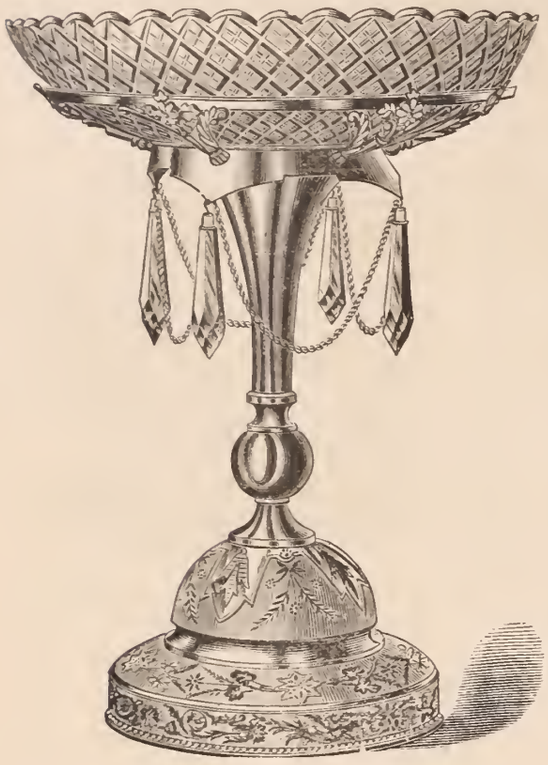
SOLE AGENTS FOR THE ITHACA CALENDAR CLOCK COMPANY.

Illustrated Catalogues and Price Lists furnished to the Trade upon application.

SIMPSON, HALL, MILLER & CO.

Fine Electro-Silver Plated Ware,

Factories, Wallingford, Conn. Salesroom, No. 676 Broadway N. Y.



One of the oldest and most reliable manufactories in the country.

Our Solid Table Ware is made of the Best Nickel Silver.

Spoons, Forks, Ladles, Pie Knives, &c.

IN GREAT VARIETY OF PATTERNS.

Solid Steel Knives, superior article and Heavily Plated for Service.

OUR HOLLOW WARE consists of Tea Sets, Urns, Tea Trays, Spoon Holders, Milk and Water Pitchers, Butter Dishes with glass plates, Cake Baskets, Biscuit Bowls, Berry Dishes, Fruit Stands, Pickle and Jelly Dishes, Dinner and Breakfast Castors, Oyster and Soup Tureens, Baking Dishes, Steak Dishes, Vegetable Dishes, Celery and Salad Dishes, Syrup Cups, Tray and Rack for holding Spoons and Forks, also with Call Bell attached (patented). Toilet Sets in great variety of patterns, beautiful glass, richly mounted with silver, Vases, Card Stands combined. The glass Vases are of various patterns and styles; cut and fancy, of the most beautiful designs and mounted in the most elegant silver frames and stands. Centre Pieces and Epergnes, the most elaborate or plain, as desired; in fact thousands of articles in the line of Silverware, and all warranted to be first-class and exactly as represented.

☞ Our facilities being second to none to produce the finest and most serviceable *ELECTRO-PLATED WARE*, at the lowest possible price. By years of experience, close attention to business, and our unsurpassed facilities, we are enabled to produce goods as cheap, if not cheaper, than any other concern in this country, consequently dealers can feel assured that they will always get goods from us at the very lowest price. The pride of our house is to make the finest goods, and sell them at fair prices, and please our customers, by honorable dealings, and retain the reputation which, we believe, is unquestioned as to our making the best of goods and also the cheapest.

PATENT BUTTER DISH.

We have introduced this season an entirely new and novel Butter Dish. The convenience of its opening and closing can but strike one favorably. Its beauty of design and workmanship must please everybody. We have produced other valuable designs and patents in the way of Butter Dishes as well as many other useful articles in our line, but this is the most complete and perfect in its arrangement of anything heretofore produced, and must take the lead of all other first-class Butter Dishes in the market.

DAVID F. CONOVER & CO.,

(SUCCESSORS TO WM. B. WARNE & CO.)

Importers, Manufacturers and Wholesale Dealers in

WATCHES AND JEWELRY,

Silver and Silver-Plated Ware,

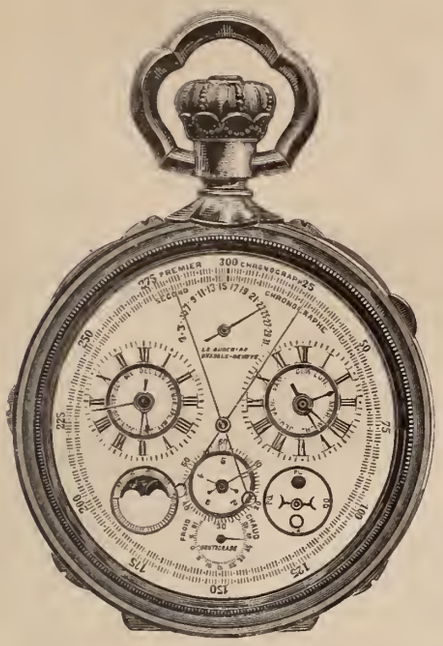
AMERICAN WATCH WHOLESALE SALESROOM,

Southeast Corner Chestnut and 7th Sts.,

(FIRST FLOOR.)

DAVID F. CONOVER,
B. FRANK WILLIAMS,
C. EDGAR RIGHTER.

PHILADELPHIA, PA.



J. EUGENE ROBERT,

Importer of Watches,

—AND—

Watch Movements of Every Description,

No. 30 Maiden Lane, New York.

Would respectfully direct the attention of the Trade to LOUIS AUDEMARS' CELEBRATED WATCHES, universally acknowledged to be the FINEST FINISHED, and the most perfect time-keeper made. The manufacturer has achieved a world-wide reputation for the excellence of his watches, and for which he has received numerous gold medals from the prominent Expositions of the world.

The above wood cut represents the prize watch, now at the Paris Exposition—*a marvel of horology.* It is a clock striking watch; striking hours and quarters in passing, minute repeating at will, double chronograph, acting independently, double time, perpetual calendar, showing the phases of the moon, metalic thermometer, lever escapement, cylindrical hairspring, compensated to temperature and positions, 45 ruby jewels, triple stem-winder and double hand-setting attachment.

☞ In addition to the above we have a full line of the most desirable mercantile Watches to be found anywhere.



JOSEPH FAHYS,

MANUFACTURER OF

SILVER WATCH CASES,

TRADE No 1 MARK.

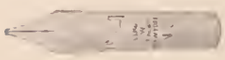
OFFICES AND SALESROOMS:

9 Maiden Lane, New York. 78 Monroe Street, Chicago.

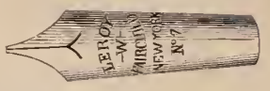
I would respectfully announce an important REDUCTION in the prices of my **Silver Cases,** and would also direct the special attention of the Trade to the SUPERIOR FINISH and WORKMANSHIP of the same. The quality of these Cases are fully sustained, are guaranteed full weight, and made throughout of United States standard coin silver, as indicated in the above certificate.

☞ Price Lists furnished by Jobbers and the undersigned.

JOSEPH FAHYS.



GOLD MEDAL, PARIS, 1878.



☞HIGHEST PREMIUM IN EVERY INSTANCE OF COMPETITION.

AWARDS.—Paris Exposition, 1867; Vienna Exposition, 1873; American Centennial Exhibition, 1876; Australian Fxposition, 1877; American Institute, 1847, 1848, 1849, 1850, 1852, 1853; South Carolina Institute, 1870; North Carolina Institute, 1870; American Institute, 1876.

LEROY W. FAIRCHILD,

MANUFACTURER OF

GOLD PENS,





PEN AND PENCIL CASES,

In Solid Gold, Silver, Gold-mounted Pearl, Ivory, Rubber, &c.

Our Specialty is:—*Strictly First-class Goods. Every Article of the Highest Standard.*

No. 110 WILLIAM STREET, NEW YORK.

☞CATALOGUES SENT ON APPLICATION.

LOUIS STRASBURGER & CO.,

Importers and Makers of Watches,

OF EVERY DESCRIPTION,

From the Finest Stem-Winding and Setting Goods to the Lowest Priced Watch in the Market.

OUR STOCK is unusually complete and attractive and embraces an assortment of the best COMMERCIAL WATCHES to be found anywhere ranging from $4.00 to $600 each.

We would also call the attention of buyers to our select display of fine TIMING and COMPLICATED WATCHES, CHRONOGRAPHS and REPEATERS, of every description, from the establishments of the most eminent makers.

☞We are also the Sole Agents for the INTERNATIONAL WATCH CO.'s WATCH, so well and favorably known in this market.

LOUIS STRASBURGER & CO.,

NO. 15 MAIDEN LANE, NEW YORK.

Diamond Bureau,
No. 30 Boulevard Haussmann,
PARIS

WATCH FACTORY,
CHAUX DE FONDS, SWITZERLAND.



Mabie, Todd & Bard,

Manufacturers of

GOLD PENS,

Pen Holders, Pencil Cases and Tooth Picks,

in Gold Mounted Rubber, Pearl, Ivory and Solid Gold,

180 Broadway, **New York.**

We were awarded a Medal & Diploma, at the Centennial Exhibition, for excellence of designs, and high quality of workmanship.

Illustrated Catalogues and Price Lists sent to the trade upon application.

Boston, Sept 17th 1878

Messrs. Mabie, Todd & Co.

Gentlemen,

I have sent one of your pens, to have a point mended, through Messrs. Hooker, Lewis & Co. of this city.

You may like to know that I have used this pen constantly for more than twenty years, from the days of a book of mine called "The Autocrat of the Breakfast-table" 1857–8 until last Friday without repair and always with perfect satisfaction. I have written with it half a dozen or more volumes, a large number of Essays etc and thousands of letters.

I feel to it as to an old friend and I hope you will do the best you can for it, though I have in the mean time bought another of your make – "corrugated" – marked C.

I do not know whether you care for this testimonial, but I feel as if the pen which has carried out so much of my thought and brought back so much in various forms in return was entitled to this certificate of honorable service.

I am, Gentlemen Yours truly

Oliver Wendell Holmes.

THE

Meriden Britannia Company,

UNION SQUARE, (46 East 14th Street, NEW YORK,

Manufacturers of Fine Silver-Plated Ware,

Combining every Modern Improvement in Plating and Elegance of Design, with Sterling Quality. Our Assortment consists in part of

Spoons, Forks, Table Cutlery, Dinner, Tea and Dessert Sets, Entre Dishes, Epergnes, Castors, Cake Baskets, Ice-Water Sets, Tea and Coffee Urns, Salvers, Communion Ware, &c.



From Gebbie & Barrie's "Masterpieces of the U. S. International Exhibition, 1876."

We take much pleasure in referring to the reputation we have for many years maintained for manufacturing SPOONS and FORKS bearing the Trade Mark, "1847, ROGERS BROS."

☞Particular attention is invited to our Patented Process of Electro-Plating Spoons and Forks, by which the parts most exposed to wear received an EXTRA coat of SILVER. This feature renders these goods more economical and durable than those of any other manufacture, while the increased cost is relatively small. This method of plating we apply to the 4, 8 and 12 oz. plate, as required ☞To protect the purchaser against imitations, it should be observed that the IMPROVED SPOONS AND FORKS bear our Trade Mark, "1847, ROGERS BROS., XII."

Manufactories, West Meriden, Conn. Warerooms, UNION SQUARE, NEW YORK.

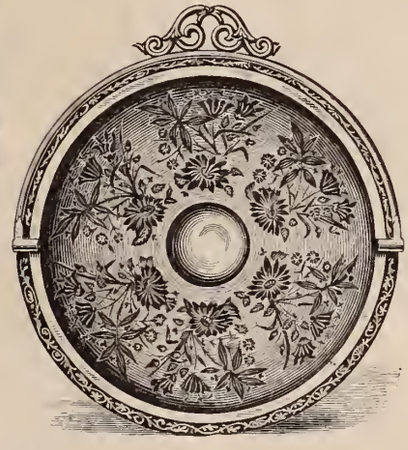
THE MIDDLETOWN PLATE COMP'Y,

Have added the following low priced goods, but of the best quality, to their large and unrivalled assortment.

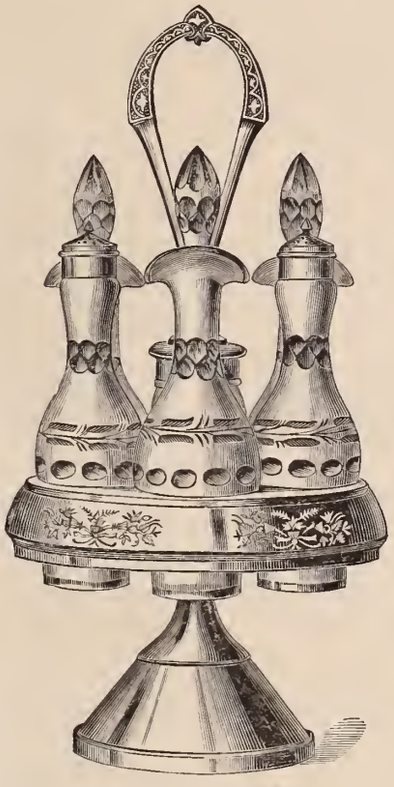
QUALITY OF ALL GUARANTEED TO BE THE BEST!

TRADE MARK. TRADE MARK.

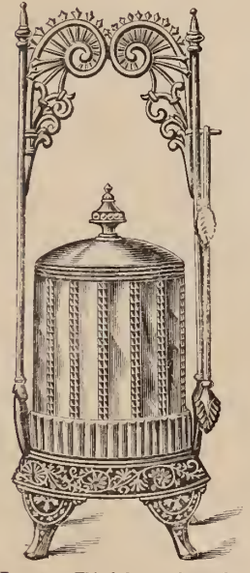




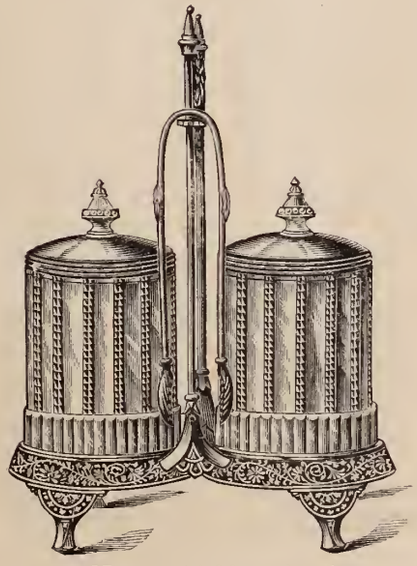
No. 1771, Basket, plain.... ....$5.00 } Gilt, extra..... .. $2 00
" " " chased,... .. .. 5.50 }



No. 146, Castor, 5 bottles, plain,.. $4.75
" " 5 " chased... 5.25
" " 6 " plain.... 5.75
" " 6 " chased... 6.75



No. 94, Pickle, 1 bottle, with fork, $3.00



No. 94, Pickle, 2 bottles, with fork, $5.00



No. 436, Butter, plain.....$3.50
" " " chased..... 4.00
No. 435, " cow tip, same price as above

Middletown, Conn. and 13 John St., New York.

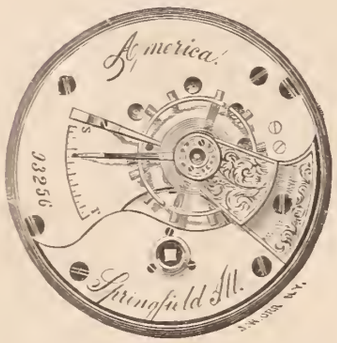
ILLINOIS

Springfield Watch Company,

MANUFACTURERS OF

KEY AND STEM-WINDING MOVEMENTS.

No. 1



Key Wind, 7 Jewels.

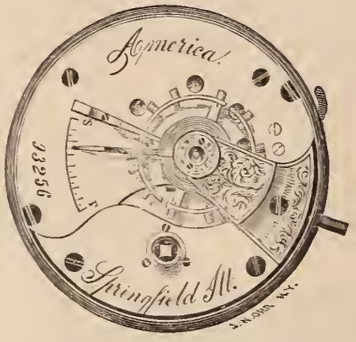
18 SIZE,

FULL PLATE.

CUT

EXPANSION BALANCES.

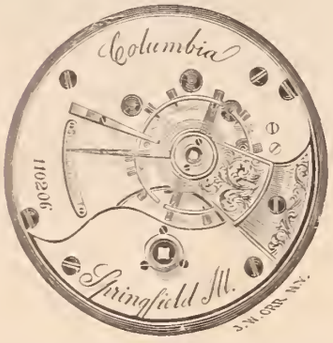
S. S. Dials.



No. 1

Stem Wind, 7 Jewels.

No. 2



Key Wind, 11 Jewels.



No. 2

Stem Wind, 11 Jewels.

The above new and desirable grades are now being delivered, and are furnished as above described, or or without *grade* trade marks, and in such case, being designated by the numbers 1 and 2, and engraved "*ILLS. SPRINGFIELD WATCH CO.*"

"Interior," "America," and "Columbia" *Stem-Winders* will be furnished with *XII.* at pendant and seconds opposite, for *OPEN FACE* Stem-Winding Cases. Any *other* grades on our list will be mode *on order* in the same manner, in quantities of five or more of a grade—without extra charge.



Improved *Old English* Dials have been added to the "*Bunn*" grade: handsome *double sunk* Old English Dials, to the "*Stuart*" grade, making them especlally attractive and desirable. This the Trade will doubtless appreciate when taken in connection with their known time-keeping qualities.

New Price-Lists, having above additions, dated *AUGUST 1st*, will be furnished by wholesale dealers, or the Company, upon application, enclosing business card

OFFICES.

11 MAIDEN LANE, NEW YORK. SPRINGFIELD, ILLS.

"LE ROI,"

THIRTY HOUR LEVER TIME.

THIS CLOCK

WILL RUN IN

ANY POSITION.

HAS A FINE

NICKEL MOVEMENT.

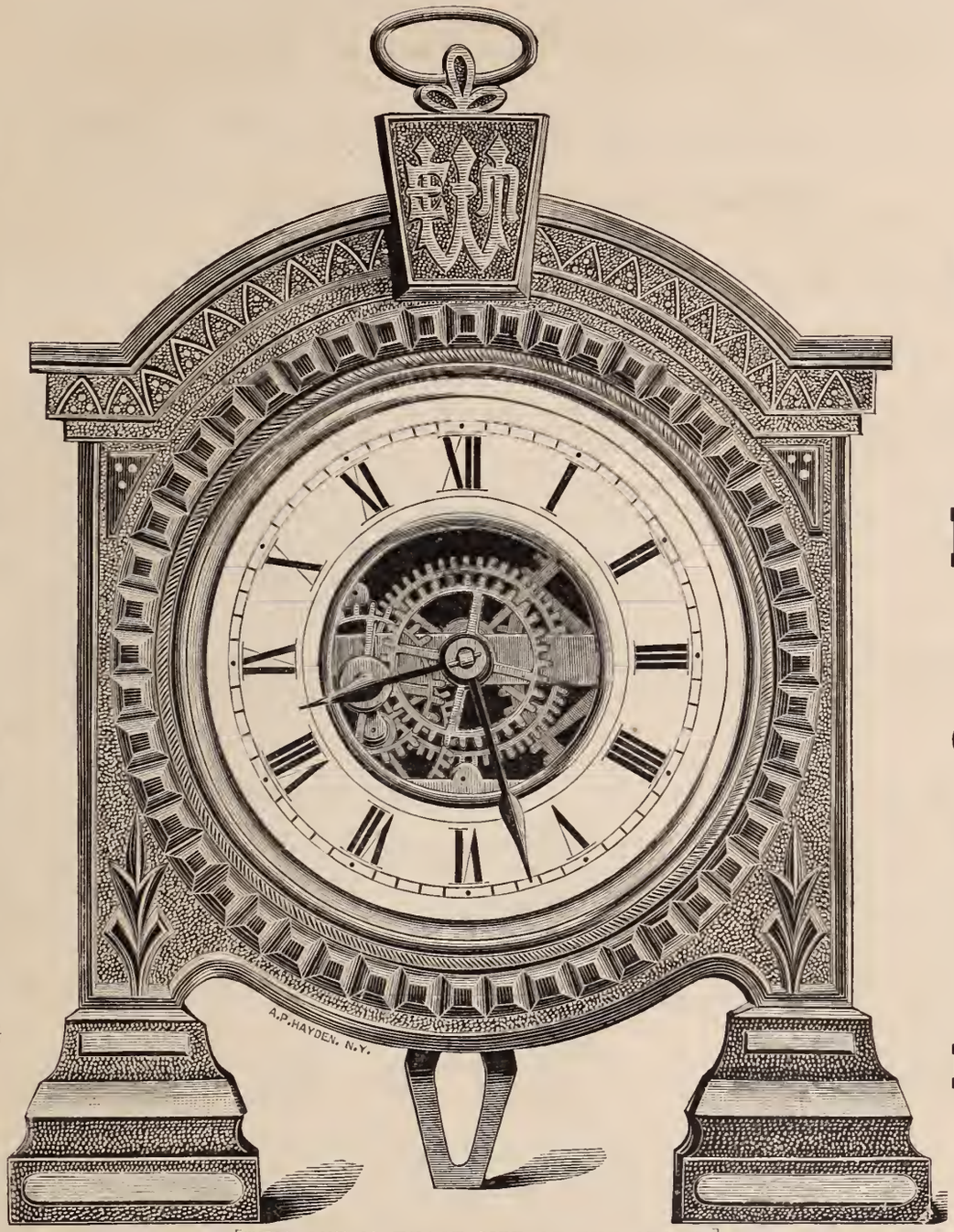
IS A

Stem Winder.

WINDS AND SETS

EVERYTHING

At the Back.



[THIS CUT IS EXACT SIZE OF THE CLOCK.]

THE

MOVEMENT

IS PROTECTED AT

FRONT and BACK

— BY —

CLOSE FITTING

CAPS,

SO THAT THE

DUST CANNOT GET IN.

PRICE, GILT OR NICKEL, $4.50; ALARM, $5.00.

MANUFACTURED ONLY BY

The E. N. Welch Manufacturing Co.,

FORRESTVILLE, CONN., U. S. A.

GEORGE W. BROWN, Agent, 32 Warren Street, New York.

☞ *Also a full assortment of CLOCKS of the following manufactures:* **E. N. Welch Mf'g Co., Welch, Spring & Co., Atkins Clock Co., at Factory prices.**

J. C. AIKIN. H. A. LAMBERT. J. B. SHEA.



AIKIN, LAMBERT & CO.



Removal to No. 23 MAIDEN LANE, NEW YORK.

MANUFACTURERS OF GOLD PENS,

Pen and Pencil Cases, Pencils, Tooth Picks,

And Leading "Novelties" in Pencil Goods.



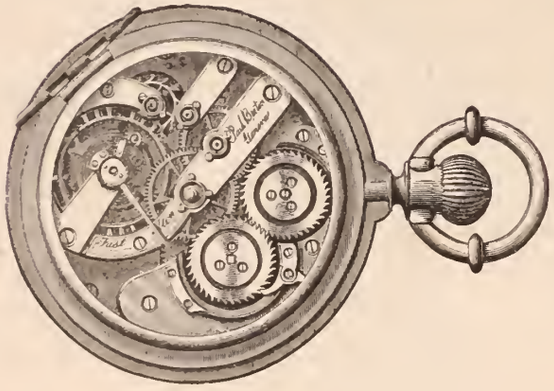
In connection with our Gold Pen and Pencil goods, our line of "Novelties" in Pencil Charms has been largely augmented this season by a variety of NEW and NOVEL patented articles, which are artistic in design, and will prove a valuable addition to the line of Holiday goods.

We are also making this fall some Charm NOVELTIES, adapted to the JEWELRY trade, and on which we are offering SPECIAL INDUCEMENTS. ☞ Send for Circular and Price List.





ALSO,



Importers of all Grades of

WATCHES.



Sole Agents for

"Paul Breton" and "Chas. Latour," Geneva.

SPECIALTIES.

AGASSIZ Movements, Gilt and Nickel, Stem-winding, fitting Ladies' Riverside Case.
CHAS. LATOUR " " " Key-winding, " 10 and 16 size Waltham Case.
PAUL BRETON " " " a full line of these CELEBRATED watches.

Metal Cased Open Face STEM-WINDING, "EXCELSIOR" and "LONGINES," 16, 18 and 20 line, the BEST metal watches, in STYLE and QUALITY, in the market. BLACK and FANCY DIALS are NOVELTIES in these watches, which are having a rapid sale.

AMERICAN WATCHES of all kinds. Gold Cases of all styles made to order. Sole Agents for EUREKA HORSE TIMER, the cheapest reliable Timer ever made, and for PNEUMATIC TIMER, which does not require the use of the hand.

We guarantee all watches sold by us, and have recently reduced our prices.

Our display of JEWELRY for the Fall Trade is complete, consisting of a general line of RELIABLE goods, both in GOLD and ROLLED PLATE, of new and tasty patterns. Special attention paid to ORDERED WORK and REPAIRS. GOODS SENT ON APPROVAL and CORRESPONDENCE invited. Those not acquainted with us will oblige by giving references when ordering.

Branch, No. 113 East Madison Street, Chicago.

J. C. AIKIN. H. A. LAMBERT. J. B. SHEA



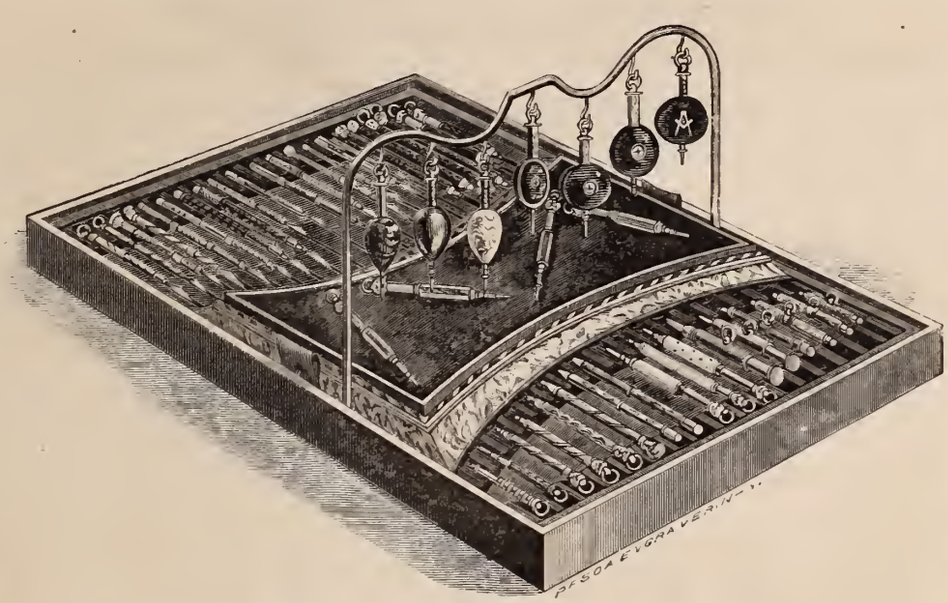
Aikin, Lambert & Co.

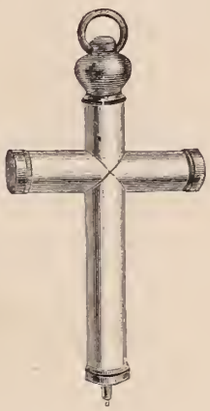


Removed to 23 Maiden Lane, New York.

Manufacturers of Gold Pens, Pen and Pencil Cases, Tooth Picks, and Leading "Novelties" in Pencil Goods.



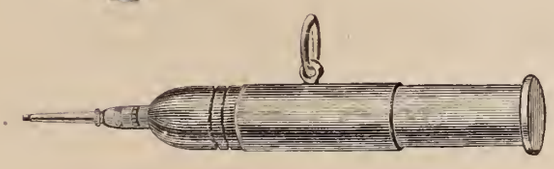


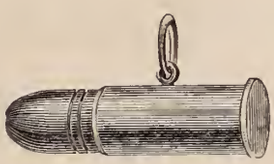






NOVELTY TRAY ASSORTMENT.







SPECIAL. ☞ Under Letters Patent we are now introducing something ENTIRELY NEW, and which we feel will meet the wants of the trade, an article that is rich, elegant and artistic in design, viz.:—The inlaying of gold and pearl in pencil barrels in form of vines, flowers, birds, initial letters, and other unique designs on Celluloid, (handsome, plain and assorted colors), mottled, malachite, and imitation shell, either of which is so close an imitation that only an expert can distinguish from the genuine.

In connection with our leading "NOVELTIES" of last season, we show cuts of a few, and mention in this issue our Plated Cartridge Pencil and Watch Key, Imitation Locket (Real Stone) Magic Pencil, Imitation Locket, (Intaglio) Magic Pencil, Imitation Shell Charm Locket Pencil (inlaid with pearl and gold), Imitation Shell, also Celluloid "Ball" Magic Pencil (inlaid with pearl and gold), nickel and plated magic "Cross" Pencil, &c., all of which are NEW TO THE TRADE, and UNEXPENSIVE, costing but a slight advance over the ordinary goods.

☞ The above have been PATENTED, and are manufactured by ourselves exclusively.

☞ SPECIAL ATTENTION CALLED TO OUR "NOVELTY TRAY" ASSORTMENTS, which embraces all the above goods, together with a line of Tooth Picks and Pencils, in plated and gold, ranging in price from fifty ($50) dollars and upwards.

LIBERAL AND SPECIAL INDUCEMENTS OFFERED. SEND FOR PRICE LIST AND CIRCULAR.

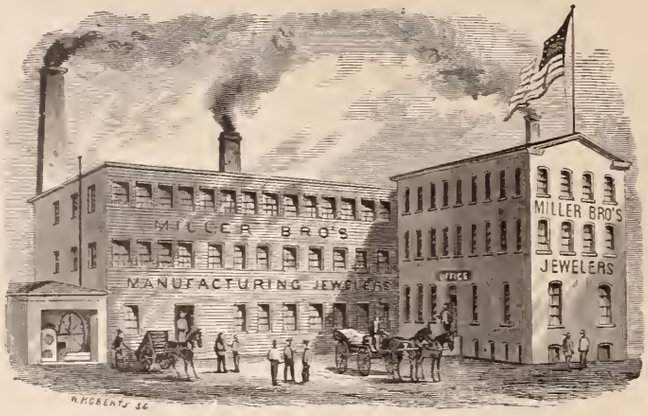
MILLER BRO'S,

MANUFACTURING JEWELERS,

No. 11 MAIDEN LANE, NEW YORK.

Manufactory, 47, 49 & 51 Franklin Street, Newark, N. J.

INITIAL GOODS A SPECIALTY!



Seals, Lockets, Sets, Sleeve Buttons, Studs, Collar and Chemise Buttons.

ATTENTION IS INVITED TO OUR

NEW STYLES OF ETRUSCAN SLEEVE BUTTONS,

MOUNTED WITH

RUSTIC LETTERS,

BIRDS, ANIMAL HEADS AND FANCY ORNAMENTATIONS

C. G. ALFORD & CO.,

MANUFACTURING JEWELERS,

No. 183 Broadway, New York.

Among our Specialties, we this season offer to the Trade the most complete and attractive line of Real Novelties in FINE ROLLED PLATED CHAIN ever before introduced. The standard quality of our Chain will be fully maintained, while our prices will tempt the most scrutinizing buyer.

Dealers in search of Novelties will find it to their interest to send for our Illustrated Catalogue of Designs, which will be forwarded, on application, to the legitimate Jewelry Trade only.

GORHAM M'FG. CO.

SILVERSMITHS.



SALESROOMS,
37 UNION SQUARE, N. Y.
Branch Office, 120 Sutter St., San Francisco.
Factories, Providence, R. I.

TO THE TRADE.

NEW YORK, October 5th, 1878.

IN calling attention to our ILLUSTRATED SHEET, issued with this number of THE JEWELERS' CIRCULAR, we take the opportunity of correcting some false impressions, which certain of our competitors in business have endeavored, by false statements, to instill into the minds of our customers.

For about half a century we have manufactured solid silverware for the trade, and during those fifty years have uniformly supplied articles superior to any in the market. Consequently our trade exceeds that of any other house, and we are able to offer to our customers a constant succession of novelties, which would be impossible for a smaller manufacturer. As an illustration, we would mention that our Spoon and Fork trade has increased very largely of late, for the reason that our patterns are admittedly far in advance of all others in the market.

While others have suffered from business depression we have experienced a constantly increasing demand, and we are now selling more in this line of goods than at any time in the history of our firm.

Our stock of hollow-ware is being continually renewed by fresh designs, especially in small novelties, and our fancy pieces with colored decorations are so popular that other houses have tried to imitate them. So complete, however, has their failure been, from lack of good taste, skill and facilities of production, that the goods are only to be seen in their own salesrooms, where they appear to be on permanent exhibition. On the other hand our novelties in color decorations have already won the commendation of the trade as specimens of high character art work, while a ready sale is commanded at the prices asked for them.

Some of our competitors are constantly repeating the old story "Our goods are cheaper than Gorhams!" We deny this and ask the trade to compare prices *with the goods before them.* We claim that we make and offer a better article at the same price (and in some instances for less) than is generally charged for wares of inferior design, quality, finish and intrinsic value.

We are not ambitious to be reputed as "cheap silversmiths," for of such the trade is too well supplied. To those who buy silverware regardless of quality, design, finish and beauty, and merely because it is cheap, we would say; "Our wares will not suit you, nor do we wish for your custom." To those who wish to offer their customers the finest class of goods for the lowest prices at which such goods can be made and sold we would say; "We offer you wares which cannot be found elsewhere at like rates."

Fine goods are not always the most expensive, but are the result of skilled labor, and good taste must be combined with proper facilities for manufacture. These requisite sare assuredly not possessed by some firms who claim to call themselves "Silversmiths."

In addition to our line of regular goods we are continually producing elegant designs in large pieces, such as Tea and Dinner Ware, Epergnes, Dessert Services, &c.; and in larger Hollow-ware we are now making some fine pieces of *Repoussé* work in a higher school of art than has hitherto been studied in this country. We offer the entire trade the benefit of our enormous stock of these extra goods, and shall be pleased to forward, on approval, a liberal selection of such articles to any member of the trade in good standing—thus enabling dealers to effect sales of larger pieces than would be possible from their own stock—an advantage which cannot be offered to the same extent by any other manufacturer.

GORHAM PLATED WARE

These goods are offered to the trade as being a better article of plated ware than has ever been before produced, either in this country or in Europe, and superior to anything now in the market. The advantage to the trade of offering goods of an established reputation, such as the GORHAM MANUFACTURING COMPANY'S, must be conceded by all. Our prices for these goods have been considerably reduced from those of former years, while the quality has been rigidly maintained.

☞Photographs and prices furnished upon application.

SPIESS & ROSSWOG,

MANUFACTURERS OF FINE

Jewelry and Diamond Goods,

LOCKETS, CROSSES, SLEEVE BUTTONS & NECKLACES,

RICH SETS IN CORAL, ROSE, STONE CAMEO, INCRUSTED AMETHYST AND CORAL CAMEO.

Nos. 9 & 11 Maiden Lane,

NEW YORK.

ESTABLISHED 1837.

VICTOR BISHOP & CO.

IMPORTERS OF

DIAMONDS,

PRECIOUS STONES

—AND—

CORAL JEWELRY,

No. 47 NASSAU STREET, NEW YORK.

House in Paris, 66 Boulevard de Sebastopol.



TINGLEY, SINNOCK & SHERRILL,

MANUFACTURERS OF

FINE JEWELRY,

NO. 5 MAIDEN LANE, NEW YORK.

Factory, Newark, N. J.

J. B. & S. M. KNOWLES,

MANUFACTURERS OF

Sterling Silverware

Office, No. 20 MAIDEN LANE,

NEW YORK.

Factory, No. 93 PINE STREET, PROVIDENCE, R. I.

ESTABLISHED 1859.

RINGS A SPECIALTY.

BRYANT & BENTLEY,

No. 12 Maiden Lane, New York.

MANUFACTURE A LARGE VARIETY OF

FINE SOLID RINGS,

For Ladies and Gentlemen, in CAMEO, AMETHYST, ONYX, TOPAZ, TURQUOISE, GARNET and other stones, Fine CAMEO, CORAL and ROMAN SETS of new and handsome designs. LOCKETS, MEDALLIONS, SHAWL and SCARF PINS, SLEEVE BUTTONS, STUDS, &c. All goods warranted.

☞ We continue to manufacture several hundred patterns of **HARD SOLDER RINGS**, in every style, for men, women and children, stamped and warranted 16 carat fine.

BUCKENHAM, COLE & SAUNDERS,

SUCCESSORS TO

BUCKENHAM, COLE & HALL,

IMPORTERS OF

Diamonds, Pearls

AND OTHER PRECIOUS STONES,

MANUFACTURERS OF FINE JEWELRY,

10 Maiden Lane, New York.

☞ A large stock of FINE DIAMONDS, Mounted and Unmounted kept constantly on hand. Goods sent on approval to any part of the country on receipt of satisfactory references.

E. HOWARD & CO.,

MANUFACTURERS OF

Fine Watches, Regulators, Office Clocks,

Electric Watch Clocks & Tower Clocks,

Office, No. 694 BROADWAY,

Corner Fourth Street, NEW YORK.

No. 114 TREMONT STREET, BOSTON.

J. W. J. PIERSON, - - AGENT.

SAXTON, SMITH & CO.

MANUFACTURERS OF

Fine Gold Chain.

No. 194 BROADWAY

New York.

Factory, No. 183 Eddy Street, Providence, R. I.

☞ **Sole Agents for the new PATENTED CHAIN BAR, containing a Detachable Pencil.**

HELLER & BARDEL,

MANUFACTURERS O

DIAMOND JEWELRY,

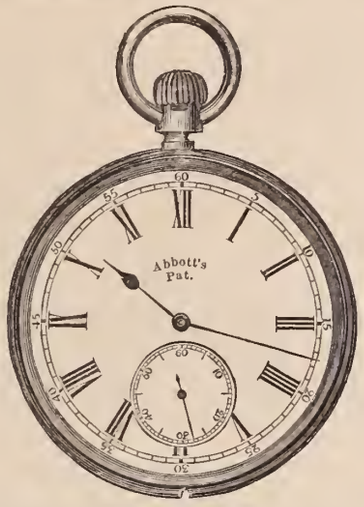
And Dealers in Diamonds,

No. 13 John Street, New York.

☞A full line of DIAMONDS, mounted and unmounted; also, a large assortment of first-class DIAMOND MOUNTINGS of our own make always on hand. We will send goods on selection to responsible houses.

☞ **The Patent 12 o'clock Stem-Winders and Stem-Setters, with Seconds Hand; made to Wind at Figure XII. instead of at Figure III.**

☞ We have also on hand the **Arburndale Horse Timers,** for which we solicit orders



☞ We desire to call the special attention of Watch Dealers and Jobbers to the fact that we have made arrangements with the patentee for the manufacture and exclusive sale of his **Patent Open Face, Full Plate, Stem Wind Attachments,** indicated in the annexed design

☞ These Stem Wind, and Hand Set Attachments can be applied to the regular 18 size Key Winding Movements, made by the WALTHAM ELGIN and SPRINGFIELD WATCH COMPANIES, and warranted by us to be both accurate and reliable.

The great increase in the demand for American **Open Face** Watches in the past few years renders this a very desirable improvement. ☞ When requested we will send samples of these Watches for examination and approval.

J. T. SCOTT & CO., No. 11 Maiden Lane, New York.

Jobbers, Manufacturers & Importers of Watches, Jewelry, Chains, Diamonds, &c.

WOOD & HUGHES,

STERLING

Silverware Manufacturers

No. 16 JOHN STREET,

NEW YORK.

Geo. Krementz. J. A. Lebkuecher.

KREMENTZ & CO.,

Manufacturing Jewelers,

No. 13 John Street,

Factory, 361 MULBERRY ST., Newark, N. J.

NEW YORK.

WHITING M'F'G COMPANY,

SILVERSMITHS.

TRADE  MARK.

STERLING

WORKS & WAREROOMS,

Broadway & Fourth St., New York.

WHOLESALE ONLY.

DISSOLUTION.

The copartnership heretofore existing between the undersigned, under the firm name of SMITH, HEDGES & CO., is this day dissolved by mutual consent. Any of the partners will sign in liquidation.

ALFRED H. SMITH,
WILLIAM S. HEDGES,
JAMES HEDGES,
HARRISON B. SMITH.

No. 1 MAIDEN LANE, NEW YORK,
JULY 13th, 1878.

The undersigned have this day formed a copartnership, under the firm name of ALFRED H. SMITH & CO., *and continuing business as Importers of Diamonds, have removed to No.* 14 *John Street.*

ALFRED H. SMITH.
HARRISON B. SMITH.

New York, July 15*th*, 1878.

The undersigned have this day formed a copartnership, under the firm name of WM. S. HEDGES & CO., *and continuing business as Importers of Diamonds, have removed to No.* 170 *Broadway, corner of Maiden Lane.*

WM. S. HEDGES.
JAMES HEDGES.

New York, July 15*th*, 1878.

CARTER, HOWKINS & SLOAN,

Makers of Fine Jewelry

Consisting of Chains, Bracelets, Sets, Pins, Studs, Sleeve Buttons, Rings, &c., in Roman, Etruscan and Enamel.

Whiting Building, Corner Broadway and Fourth Street,

A. CARTER JR.
WM HOWKINS,
A. K. SLOAN.

NEW YORK.

C. E. HASTINGS,
GEO. R. HOWE,
W. T. CARTER.

Established 1817.

Ve. J. MAGNIN, GUÉDIN & CO.

Manufacturers and Importers,

FINE SWISS WATCHES,
REPEATERS, CHRONOGRAPHS & CALENDARS.
GENEVA GOLD JEWELRY,
FRENCH CLOCKS AND BRONZES,
RICH FANCY GOODS,
HORSE-TIMERS & PODOMETERS,
GOLD AND SILVER CHATELAINE WATCHES.

No. 652 BROADWAY, NEW YORK.

Sole Agents for the James Nardin Watch.
House in Geneva, 14 *Grand Quai.*

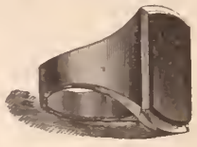
HALE & MULFORD,

MANUFACTURERS OF

RICH JEWELRY,

First-class Goods of our own make exclusively.





Special attention is called to our Patent STONE BACK SEAL RINGS.

Send for illustrated circular.

No. 694 Broadway, cor. 4th Street, New York.
(WHITING BUILDING).

BALDWIN, SEXTON & PETERSON

MANUFACTURERS OF

Fine Jewelry,

Diamond and Stone Cameo Goods,

GOLD CHAINS, &c.

Importers of Diamonds, Pearls, Emeralds, Rubies, &c.

WHITING BUILDING,

Cor. Broadway and Fourth Street,

NEW YORK.

OFFICE OF

THE ADAMS & SHAW COMPANY

SILVERSMITHS

694 BROADWAY, NEW YORK

TO THE TRADE.

We beg the favor of your attention to a few facts which we think may be of interest to our friends in the trade, and especially to the large number who have so satisfactorily handled our goods during the past year.

We have greatly enlarged our variety and stock of **Small Silver for Wedding and Holiday Gifts**, and it is conceded that a cleaner stock of desirable goods at satisfactory prices cannot be found in the city.

We call your especial attention to our patterns of **Spoons and Forks**, which are regarded as the most successful in the market.

We are prepared to furnish designs and estimates for Testimonials, both public and private, Military and Long Range Rifle Matches, Race Cups, etc., etc., upon application.

ELECTRO PLATE

We also make the very finest **Hard Metal, Silver-Soldered Plated Ware**, and were the first to discard entirely the use of soft solder in soldering the joints, mounts, etc., and no such weak spot or defect can be found in any piece of ware ever made by us.

We are always happy to answer enquiries relating to our business, and will be pleased if you will favor us with a call when you are in the city.

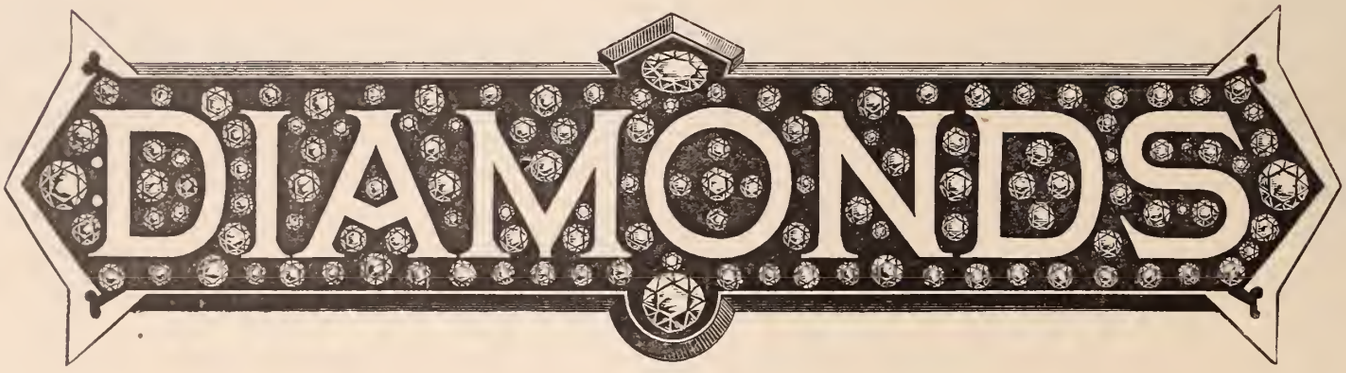
Very respectfully yours,

THE ADAMS & SHAW COMPANY.

ALFRED H. SMITH & CO.,

(OF THE LATE FIRM OF SMITH, HEDGES & CO.)

IMPORTERS OF



No. 14 John Street.

NEW YORK.

☞ *Offer to the Trade recent Importations of carefully selected Goods in all qualities at close figures.*

Wm. S. Hedges & Co.,

Of the late firm of SMITH, HEDGES & CO.

IMPORTERS OF

DIAMONDS,

No. 170 Broadway, cor. Maiden Lane,

NEW YORK.

Choice Brilliants in single stones and matched pairs a specialty.

WHEELER, PARSONS & HAYES,

MANUFACTURERS OF

Watch Cases, Gold Chains & Fine Jewelry,

AND DEALERS IN

AMERICAN AND SWISS WATCHES,

NO. 2 MAIDEN LANE, NEW YORK.

ONYX GOODS A SPECIALTY!

JOHN A. RILEY & CO.,

Manufacturing Jewelers,

ETRUSCAN GOLD AND CORAL SETS, ROMAN BRACELETS, NECKLACES, &C.

Nos. 7 and 9 BOND STREET

NEW YORK.

No. 126 Kearny Street, San Francisco, Cal.

J. B. BOWDEN & CO.

MANUFACTURERS OF

SOLID GOLD & STONE RINGS

A LARGE ASSORTMENT ALWAYS ON HAND.

Old No. 11 Maiden Lane, New York.

MOORE & HORTON,

JEWELERS,

No. 11 Maiden Lane, New York.

SPECIALTIES!

Stone Cameo, Onyx, Amethyst, Topaz and Pearl Rings. Studs, Collar and Sleeve Buttons.

☞Also our new fac-simile of Fine African Diamonds, mounted in Rings, Studs, Pins, Ear-rings, Scarf Pins, Medallions.

W. H. SHEAFER & CO.,

Makers of Fine Jewelry

CONSISTING OF

BRACELETS, SETTS, LOCKETS, PINS,

STUDS, SLEEVE BUTTONS, RINGS, &c.

SPECIALTY:—STIFFENED ROMAN BANDS.

No. 908 Chestnut Street, PHILADELPHIA

E. Bissinger,

Manufacturer of Jewelry,

And Importer of Diamonds,

192 Broadway,

New York.

ALLING BROS. & CO.

MANUFACTURERS OF

FINE JEWELRY,

Full Line of Roman and Mosaic Goods,

Earrings, Buttons, Studs and Rings.

SPECIALTIES:

ENGRAVED AND ENAMELED BANDS,

CAMEO GOODS.

170 BROADWAY, NEW YORK.

DYER BRAINERD. JOHN W. STEELE

BRAINERD & STEELE,

MANUFACTURERS OF

Brainerd'sPat. Lockets,



(Patented June 17, 1874.)

These Lockets combine both beauty and strength. They are made of solid 14kt. gold, and the stones used are the finest obtainable in the market. They cost no more than those of the old style, if indeed as much; and the combination of secrecy and durability renders them much more desirable. We make three sizes in four different shapes—round, oval, cushion and oblong square; and also Sleeve Buttons of the same style, containing a concealed box for miniatures, a novelty new to the Trade.



FINE GOLD JEWELRY,

No. 9 Maiden Lane,

NEW YORK.

Established 1873.

THOMAS G. BROWN,

MANUFACTURER OF

FINE JEWELRY,

NEWARK, N. J.

—AND—

9 BOND STREET, NEW YORK.

Ripley, Howland & Co.



MAKERS OF

FINE JEWELRY.



Would respectfully call attention to their patent PLATINUM TIPPED Settings for Diamonds (just introduced), an advantage dealers will readily appreciate, as the stone is held, not by yellow, but by scarcely perceptible *white* points which are equally strong and more durable than gold.

These *white* points impart an elegant appearance to the gem and relieve the setting of that coarse and unattractive look usually found in those entirely composed of silver or platinum.

PATENTED APRIL 16th, 1878.

NO. 35 MAIDEN LANE, NEW YORK.

FACTORY, 383 WASHINGTON STREET, BOSTON, MASS.

T. GRANBERY,



Manufacturer of

BLACK ONYX

GOODS.



Patented July 16th, 1878.

This Locket is made with double glasses, in numerous shapes and sizes, shows less gold, and is lower priced than any other onyx locket manufactured.

☞ Is especially designed for Ladies' and Gents' Mourning Wear.

☞ **Coral Repairing for the Trade.**

51 Nassau Street, New York.

ENOS RICHARDSON & CO.

MANUFACTURERS OF

FINE GOLD JEWELRY,

Gold Chains, Lockets, Crosses and Necklaces,

COLORED AND ETRUSCAN WORK.

All Goods sold strictly of our own manufacture.

23 MAIDEN LANE, NEW YORK.

ENOS RICHARDSON, L. P. BROWN, F. H. RICHARDSON,
THOS. SLATER, W. P. MELCHER.

Established 1846.

WILLIAM RIKER,

No. 5 Maiden Lane, New York.

Factory, 42 Court Street, Newark N. J.

CHATELLIER & SPENCE,

Manufacturing Jewelers,

652 BROADWAY, NEW YORK.

No. 1129 Chestnut Street, PHILADELPHIA, PA.

No. 12 West Street, BOSTON, MASS.

No. 120 Sutter Street, SAN FRANCISCO, CAL.

SHOEMAKER & CO.,

MANUFACTURERS OF

Onyx, Cameo and Intaglio Buttons,

AND LOCKETS.

☞ **A full line of Roman Goods, including Bracelets.**

No. 21 Maiden Lane, New York.



☞ *Diamonds loose and mounted sent on approval on receipt of satisfactory reference.*

COE, PINNEO & STEVENS,

MANUFACTURERS OF

LOCKETS,

WHITE ENAMEL STUDS & BUTTONS,

Linen Finished and

FINE JEWELRY,

Old No. 9 Maiden Lane, New York.

CARROW, CROTHERS & CO.,

MANUFACTURERS OF

FINE JEWELRY,

No. 12 John Street, New York.

Specialties!

FINE LINKED SLEEVE BUTTONS, ROMAN BAND BRACELETS, LOCKETS & CROSSES.

N. B.—We desire to call the attention of the Trade to our IMPROVED BRACELET CATCH, and our new styles of Link Sleeve Buttons.

CHARLES GLATZ,

MANUFACTURER OF

Gold and Silver Watch Cases

No. 12 Maiden Lane,

NEW YORK.

A CARD.—After the recent great Improvements to my Cases, I confidently offer them to the Trade, as being without a superior in the market, and so acknowledged by some of the best houses.

NOAH MITCHELL,

MANUFACTURER OF

Fine Gold Jewelry

CAMEO SETS, ONYX GOODS,

Medallions, Studs, Sleeve Buttons, Rings and Diamond Settings of all Kinds.

DIAMOND SETTING A SPECIALTY.

694 & 696 Broadway, cor 4th St., New York.

(WHITING SILVER MF'G CO.'S BUILDING.)

ALL ORDERS PROMPTLY ATTENDED TO.

GEO. W. PRATT. IRA GODDARD.

GEO. W. PRATT & CO.

Manufacturers and Dealers in

American and Swiss Watches

SOLID BAND AND SEAL RINGS.

Gold and Roll-Plated Jewelry.

No. 14 JOHN STREET, NEW YORK

L. SAUTER,

MANUFACTURER OF FINE

Gold & Hair Jewelry & Device Work,

Nos. 65 & 67 Nassau Street, New York.

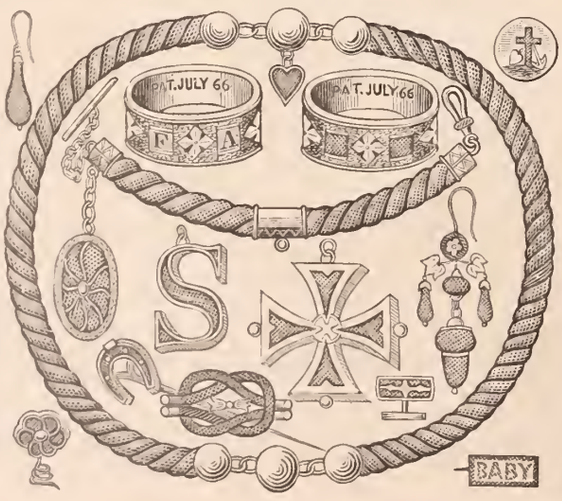
Pattern Books containing 300 design of the most current articles will be sent on receipt of 50 cents, which amount will be returned with the first order

Orders for Patterns from books of any other manufacturer filled at original prices upon advice of name and number of book.

Patentee and Sole Manufacturer of the Patent Revolving Rings, the design of which will be found in other pattern books. A complete stock of 14kt.

Solid Jewelry, as Stone Rings, Lockets, Studs Buttons, etc., constantly on hand, from which I will send for selection to responsible parties.

JOBBING OF EVERY DESCRIPTION.



MAX FREUND & CO.

Manufacturing Jewelers.



IMPORTERS OF

Watches

Jewelry and Precious Stones,

8 Maiden Lane

NEW YORK.

☞Sole Agents for the Celebrated A. Schneider Watch, Dresden.

J. A. BROWN & CO.

OFFICE AND SALEROOM: No. 11 Maiden Lane, N. Y.
FACTORY: No. 104 Eddy St., Providence. R. I.

SOLE MANUFACTURERS OF THE

Ladd Patent Stiffened Gold Watch Cases



For the Movements of the various American Watch Co.'s Gent's, Ladies' and Boys' sizes, Key and Stem-Winders, and in the following styles, BASCINE, FLAT-BEVEL, and MANSARD, (this latter as originally named, modeled and introduced by them) forming the most complete and varied line of elegant Cases ever offered for sale. It is now eleven years since these Watch Cases were introduced to the public, during which period of time they have steadily gained in popular confidence and esteem, as is evinced by the unprecedented fact in the history of the Watch Trade that more than FIFTY THOUSAND of them have been manufactured and sold. Made of thick plates of Gold and Nickel Composition, (this Composition is harder and tougher than any other metal except the gold itself, and suggested the term STIFFENED originally used by us to designate this important improvement; no other case in the world is made like it;) thoroughly welded together and rolled to the required thickness—they are, while equally handsome—stronger and more durable than the finest Solid Gold Cases of the same thickness of metal, and at ONE-THIRD or ONE-HALF the COST, and with good movements, they make the cheapest, most elegant and serviceable Watches in the market. The critical examination of these goods by the trade and public is invited. **FOR SALE BY JEWELERS GENERALLY**

☞Dealers can obtain them of the Wholesale Watch and Jewelry Houses, or their Traveling Agents, throughout the United States and British Provinces.

☞All genuine Watch Cases of our manufacture, have "G. W. Ladd's Patent, June 11th, 1867," stamped upon the side band underneath the glass bezel.

Refuse all others. Send for full Descriptive Circular.

LOUIS A. SCHERR. CHAS. H. O'BRYON. G. W. SCHERR.

LOUIS A. SCHERR & CO.

Importers and Wholesale Dealers in

Watches, Jewelry,

WATCH MATERIALS, TOOLS, GLASSES, &C.

Spectacles, Silk Guards, &c.

Wholesale Agents for American Watches.

No. 726 CHESTNUT STREET,

FIRST FLOOR,

PHILADELPHIA.

CHAS. P. HEROLD,

MANUFACTURING JEWELER,

DIAMOND SETTER

916 CHESTNUT ST. PHILA

AND DEALER IN

DIAMONDS.

N.B. A LARGE STOCK OF 18 Kt. DIAMOND MOUNTINGS, SUCH AS CLUSTER AND SOLITAIRE RINGS, EARRINGS, LACE PINS, SHAWL PINS, CROSSES, STUDS, AND GENTS' PINS, &c, ALL OF WHICH ARE OF MY OWN DESIGNS, AND ARE MADE IN THE FINEST STYLE AND FINISH.

CHATTERTON & DODD,

Makers of Fine Jewelry

Consisting of Sets, Pins, Ear-Rings, Lockets, Crosses, Sleeve Buttons, Studs, &c.

No. 19 John Street, New York.

ROMAN, ETRUSCAN AND ENAMEL WORK GENERALLY, SPECIALLY DESIGNED BY US.

ESTABLISHED 1855.

D. LIECHTY & CO.,

MANUFACTURERS OF

Fine Gold Watch Cases

No. 140 South Third Street,

Fourth Floor. PHILADELPHIA

Repairing neatly attended to.

NATHAN E. MORGAN. CHAS. B. HEADLY.

MORGAN & HEADLY,

☞ We have added to the manufacture of Gold Spectacles and Eye-Glasses those of STEEL, and are able to fill all orders with promptness. Illustrated Catalogues sent on application.



☞A full line of *DIAMONDS*, mounted and unmounted, always on hand which we will send on approval to the Trade, on receipt of reference.

ARTISAN HALL,

611 & 613 Sansom Street, Philadelphia.

Medal and Diploma of Merit
Awarded by Centennial Com.

S. C. JACKSON,

MANUFACTURER OF FINE

CASES

For Jewelry, Silver Ware
Trays, &c.

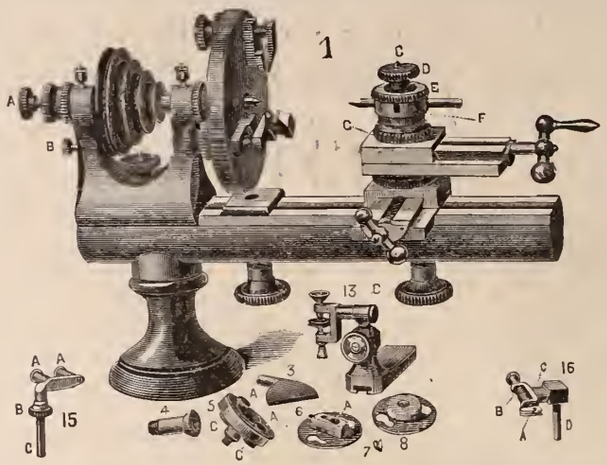
180

BROADWAY.

NEW YORK.



HOPKINS' WATCH TOOL CO.



Manufacturers of HOPKINS' PATENT WATCHMAKERS' TOOLS, em bracing Plain and Combination Lathes, Chucks, Slide and Swing Rests, Gear Cutters, Pivot Polishers, Jeweling and Staking Tools, &c.
Illustrated circulars sent on application.
HOPKINS' WATCH TOOL CO., Waltham Mass

☞THE ATTENTION OF THE TRADE IS INVITED TO OUR UNUSUALLY FINE LINE OF

ANTIQUE CANDLESTICKS,
SCONCES, CARD TABLES, &c.

WHICH WE ARE OFFERING THIS FALL AT GREATLY REDUCED PRICES.

☞*Catalogues and price list sent on application.*

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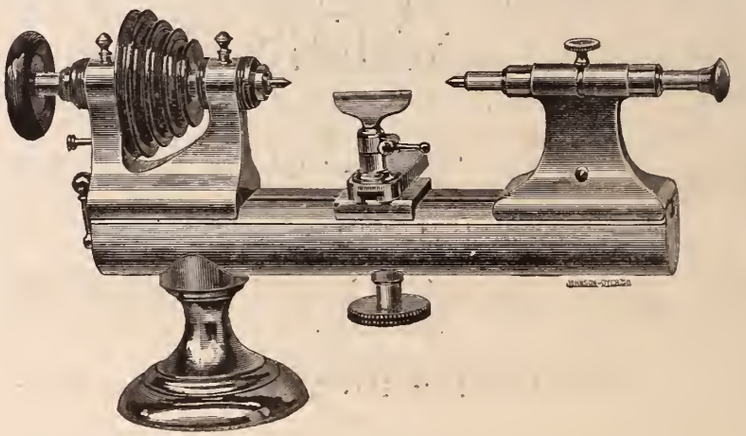
GAS FIXTURES,

67 Greene Street,
68, 70 & 72 Wooster Street, NEW YORK.

American Watch Tool Co.

Formerly J. E. WHITCOMB & Co.

Manufacturers of Watch & Chronometer Makers' Tools.



P. O. Box 969. WALTHAM, MASS



REMOVED TO No. 658 BROADWAY.

Max L. Gutmann

Rochester, N. Y.

Importer and Dealer in Watch and Jobbing Materials, Tools, Glasses, Chains, Guards and Jewelry.

GUTMANN'S AUTOMATIC

HAMMER AND PUNCHES



Patented January 8th, 1878.

This Tool takes the place of the third hand, therefore its manifold uses are quickly apparent, and I would only say, that it is accompanied by six punches, to-wit: 1 prick punch, 2 hand punches, 1 closing hole punch, 1 rivet punch, 1 pinion punch, all of which fit neatly into the punch holder, and are fastened by the set screw. Its tap is alternately heavy and light, and the finger loops are assorted in sizes. The Tool is nickel-plated and boxed, ready to be mailed.

The operation is as follows: Insert your forefinger through the loop at the top and place the third finger as a guard on the lower end of the barrel, then with the thumb and second finger of the same hand, turn the cam ring which produces the concussion on the punch. This leaves the left hand free to hold the work.

Price, $2.50 Each.

☞Sent by mail, post paid, by the manufacturer, or any first-class Tool Dealer, on receipt of price.

☞Please send your order.

MAX L. GUTMANN, Patentee & Manuft'r.

Watches and Watch Cases a specialty.

MANUFACTURERS OF EXCLUSIVELY

BLACK ONYX GOODS,

WOGLOM & MILLER,

32 & 34 JOHN STREET,

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BOOZ & THOMAS,

MANUFACTURERS OF

TRADE MARK

Watch Cases & Jewelry,

108 SOUTH EIGHTH STREET,

Second Story, **PHILADELPHIA.**

Illustrated Catalogues sent upon application.

Old Gold & Silver Bought or Exchanged.

PARTICULAR ATTENTION PAID TO REPAIRING.

TELL A. BEGUELIN,

(Successor to the late GINNEL & BRO.)

Importer of Watches

WATCH MATERIALS, TOOLS AND GLASSES,

No. 71 NASSAU STREET,

(UP STAIRS),

CORNER JOHN STREET **NEW YORK.**

Sole Importer of the TELL A. BEGUELIN'S BEST MAINSPRINGS.

☞Every description of Watches carefully repaired for the Trade.

WM. C. GREENE & CO

GOLDSMITHS

MANUFACTURERS of

RICH SETS IN TAPER WIRE CORAL

Amethyst, Coral Cameo, Stone Cameo, Enamel Sets, Engraved & Brooches, Sleeve Buttons, Studs Crosses, EAR DROPS &C.

Factory 95 PINE ST. Providence, R. I.

NEW YORK OFFICE, No. 192 BROADWAY.

WM. C. GREENE. B. W. GREENE. GEO. D. BRIGGS.

HENRY FERA,

Importer of Diamonds,

No. 9 MAIDEN LANE,

New York.

Having my own cutting and polishing establishment at Nos. 23 and 25 Looijersgracht, Amsterdam, Holland, constantly running 36 mills, I am able to offer to the trade a full assortment of Diamonds at very low prices.

Loose and Mounted Goods sent on approval to any part of the country on receipt of satisfactory references.

HAMILTONS & HUNT,

MANUFACTURERS OF

Fine Plated Chains

AND PATENT BUCKLE BRACELETS,

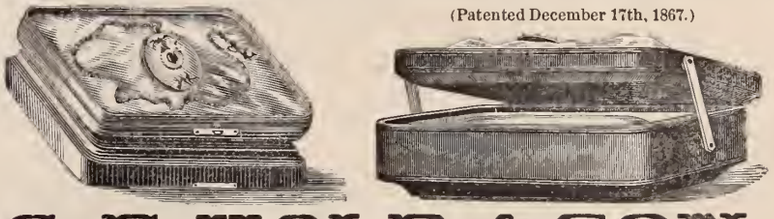
Branch Office, 176 Broadway, New York

FACTORY, 226 EDDY STREET, PROVIDENCE, R. I.

ESTABLISHED 1854. ☞Medal and Diploma Awarded at Centennial Exhibition.

JUDGES' REPORT:—Well made and good patterns—Double Hinge as a useful improvement

(Patented December 17th, 1867.)



G. F. KOLB & SON,

MANUFACTURERS OF FINE

Morocco, Velvet and Cabinet Cases,

FOR JEWELRY, WATCHES & SILVERWARE.

TRAYS FOR SHOW CASES, TRUNKS, &C.

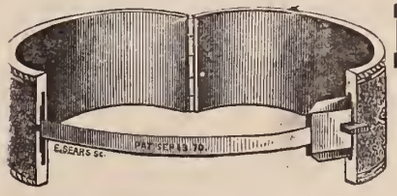
732 Sansom Street, PHILADELPHIA.

Established 1845.

WILLIAM H. BALL,

SUCCESSOR TO

BALL & BARNARD,



Manufacturing Jeweler,

Fine Gold, Enameled and Colored

BRACELETS,

A SPECIALTY!

☞All my Bracelets have the PATENT GUARD at no additional expense, Thus saving the price of chains.

No. 9 JOHN STREET, NEW YORK.

Factory, 30 & 32 Franklin Street, Newark, N. J.

Dealers in Watches,

Importers of Diamonds.

OPPENHEIMER, BROS. & VEITH,

Manufacturing Jewelers,

35 MAIDEN LANE,

S. Oppenheimer, A. Oppenheimer, } New York. { Henry F. Veith, Gus. F. Veith,

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I. PFORZHEIMER. D. KELLER.

PFORZHEIMER & KELLER,

IMPORTERS OF

Watches and Diamonds

Dealers in American Watches,

AND

Manufacturers of Jewelry,

No. 24 JOHN STREET,

P. O. Box 4144. NEW YORK.

H. Muhr's Sons, Philadelphia.

MANUFACTURING JEWELERS,

Solid Gold Finger Rings of Every Description



Crown, 18k. Lion.



On and after January 1st, 1876, our make of Filled Plain Rings will be stamped as above, which stamp is copy righted. Any and every infringement on the above Trade Mark will be dealt with according to law. ☞ Every one warranted.

THESE GOODS ARE SOLD BY ALL THE LEADING JOBBERS!

Should the house that any retailer deals with not have them we will furnish them with the address of the nearest Jobber. ☞ SELL TO THE JOBBING TRADE ONLY!

New York Office. 11 Maiden Lane.

☞ Address all communications to Philadelphia.



L. Black & Co's PATENT **Spectacle** INDICATOR.

Will indicate the exact focus required for each eye. Pat. July 31, 1878.

L. BLACK & CO.

MANUFACTURING OPTICIANS,

Detroit, Mich.

We are exclusive manufacturers of a large variety of Spectacles and Eye Glasses, in steel, silver and gold frames. Special attention is directed to our frameless, double vision and interchangeable Spectacles and Eye Glasses. For particulars and price-lists address the above-named firm.

Goldsmith & Schliesser,

(Formerly of Freund, Goldsmith & Co.)

Manufacturing Jewelers,

—AND—

Importers of Watches & Precious Stones,

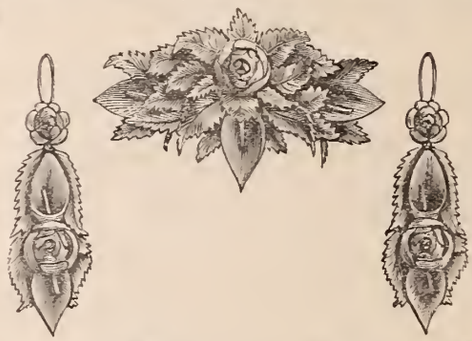
No. 5 Maiden Lane,

Factory, 53 West 4th Street, **NEW YORK.**

Sole Agents for H. L. Mathey, Locle, Switzerland.

Celluloid Novelty Comp'y,

W. S. SILLCOCKS, President. F. R. LEFFERTS, Sec'y and Treas.



MANUFACTURERS OF

IMITATION

Coral Jewelry.

4 Maiden Lane, New York.

☞ Our goods are sold by all the leading jobbers in the country.

E. A. HALDIMANN,

IMPORTER OF

Watches, Watch Materials,

AND OPTICAL GOODS;

Also DEALER IN JEWELRY,

No. 66 Nassau Street, New York.

Country orders solicited. Watch repairing and jewelry jobbing done on the premises, in the best manner, and at reasonable prices.

☞ All orders promptly attended to.

A. N. Clark, Plainville, Ct.

MANUFACTURER OF



WATCH KEYS,

WATCH CASE SPRINGS,

Watchmakers' & Jewelers'

BENCH TOOLS.

Crosby's Jeweling Tools, &c.

Sold by Jobbers in Watch Materials and Notions.

☞ **Small Articles in Metal Manufactured to order.**

L. & A. MATHEY,

IMPORTERS OF FINE WATCHES AND MOVEMENTS



Removed Feb 1st, to 16 Maiden Lane.

Independent ¼ Seconds, Plain Chronographs, Independent Split Seconds,
Minute Repeaters, Double Chronographs, Perpetual Calendars,
Minute Chronographs, Pocket Chronometers.

MINUTE CHRONOGRAPHS, WITH MINUTE REPEATER.
CHRONOGRAPHS, WITH MINUTE REPEATER.
AND A FULL LINE OF MEDIUM GRADE WATCHES AND MOVEMENTS.

Sole Agents for the H. L. MATILE WATCHES.

☞Timing and Complicated Watches a specialty. All our Watches are tried and tested before delivery. ☞Goods sent for examination on satisfactory references.

"TIME AND TIME-KEEPERS," an interestng essay on the rise and progress of Watch-making, sent frec to any address on application



Established 1828.

JACOB BENNETT & SON,

Diamond Setters and Manufacturing Jewelers,

No. 108 SOUTH EIGHTH STREET, PHILADELPHIA.

WE MANUFACTURE AND MAKE A SPECIALTY OF
EVERY DESCRIPTION OF
DIAMOND MOUNTINGS
SUPERIOR IN DESIGN AND WORKMANSHIP.



MASONIC MARKS,
Presentation & Lodge Jewels,
SOCIETY AND POLICE BADGES MADE TO ORDER.
FINE WHOLE PEARL JEWELRY.

GOODS SENT ON MEMORANDUM TO ANY PART OF THE UNITED STATES.

CROSS & BEGUELIN,

Makers and Importers of SWISS WATCHES,

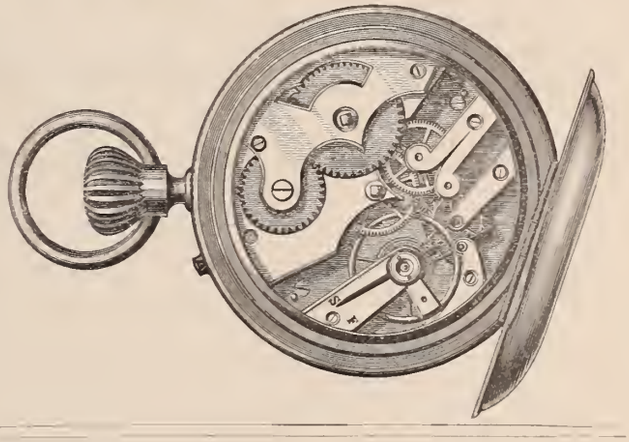
AND DIRECT IMPORTERS OF

Watch Tools, Materials, Glasses, &c.

No. 21 Maiden Lane, New York.

The CENTENNIAL WATCH (Stem-Winding and Stem-Setting) so universally popular, has achieved a standard reputation, and is generally conceded to be the best made watch for the money in this market. Being the sole manufacturers of this celebrated Timekeeper, we are enabled to give it our strong st endorsement. Especial attention is called to the "HENRY BEGUELIN," "DROZ & PERRET," and other well known Swiss Watches, as well as to our full and complete line of all grades of American Watches, on which we give the full trade discount.

☞ The attention of Watchmakers is directed to our new DRILLS, in sets of 21 sizes. The most complete and serviceable drill ever offered.



BROWN & BROTHERS,

MANUFACTURERS OF

Finest Quality of Electro-Plated Flat Table Ware.

PATENTED HEAVY SPRING TEMPERED SHANK ON FORKS AND SPOONS.

ILLUSTRATED CATALOGUES FURNISHED ON APPLICATION.

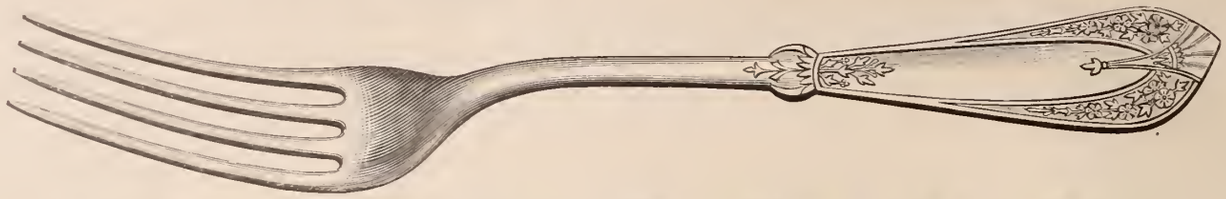
WAREROOMS, No. 81 CHAMBERS STREET, NEW YORK CITY.

FACTORIES, WATERBURY, CONN.

P. O. BOX 5731.

HALL, ELTON & CO.,

Manufacturers of the Finest Electro-Plated Ware.



UNSURPASSED IN QUALITY, STYLE AND FINISH!

Factories, Wallingford, Conn. Salesroom, 75 Chambers St., New York.

HOLMES, BOOTH & HAYDENS,

MANUFACTURERS OF

ELECTRO-SILVER PLATED

Spoons, Forks, Ladles, Fancy Pieces,

Solid Handle Steel Knives, &c., of the finest quality.

No. 49 Chambers Street, **NEW YORK.**

No. 18 Federal Street, **BOSTON.**

Works at Waterbury, Conn.

ROGERS & BRO.,

Manufacturers of First-Class Electro-Plate,

No. 690 BROADWAY, near Fourth Street, NEW YORK.

Particular attention is called to the new PATENTED PROCESS OF PLATING, whereby the most exposed parts are plated the heaviest. Also to the new Patented Heavy Spring Tempered Shanks on Forks and Spoons.

☞ *Price Lists mailed on receipt of application, enclosing business card.*

JAMES E. SPENCER, President. JOHN S. SPENCER, Treasurer.

Spencer Optical Mf'g Co.

Manufacturers of Optical Lenses.

GOLD, SILVER, STEEL AND NICKEL-PLATED

SPECTACLES.



GOLD, STEEL, RUBBER, CELLULOID AND SHELL EYE-GLASSES.

☞ Will send our Catalogue, fully illustrating all goods, to those who have not received it, on application.

FACTORIES, MT. KISKO, N. Y. Office, 13 Maiden Lane, New York.

EDWARD TODD & CO.

MANUFACTURERS OF

GOLD PENS,



Pencil Cases, Tooth Picks, &c.

No. 652 BROADWAY,

Factory, 29 & 31 South 11th St., Brooklyn. NEW YORK.

C. F. A. HINRICHS,

29, 31 and 33 PARK PLACE,

Cor. of CHURCH STREET, (Up-stairs) NEW YORK

Successor to M. WERCKMEISTER.

[ESTABLISHED 1801.]

IMPORTER AND DEALER IN

FANCY GOODS,

GLASS-WARE,

China, Bronzes, Clocks, Toys, &c.

Sole Agents for the Glass Factories of the Company "ANN," Namuroise, Belgium

Depot for Archery, Cricket & Base Ball Implements.

And C. A. KLEEMANN'S CELEBRATED GERMAN STUDY LAMPS

Agent for **ROGER'S GROUPS** in Parian, &c.

ESTABLISHED 1855.

WELCH & MILLER,

MOROCCO, VELVET AND SATIN

JEWELRY CASE MANUFACTURERS.

☞Show Case Trays in Black Walnut and Rosewood.

Velvet Cases for Diamonds a Specialty.

No. 169 BROADWAY, NEW YORK.

CATALOGUES SENT ON APPLICATION.

GEO. B. WHEELER,

NEW BEDFORD, MASS.

MANUFACTURER OF FINE

Watch and Clock Oil.



THE PORPOISE.

☞This Oil is made from the best of stock, is free from gum or corrosion, will stand the coldest weather, and is every way reliable.

L. HAMMEL & CO., Sole Agents,

No. 9 Maiden Lane, New York.

KOCH & CO., Elberfield, Prussia, SOLE AGENTS IN EUROPE.

ROSKOPF WATCH.

J. D. HUGUENIN & CO.,

GENERAL AGENTS,

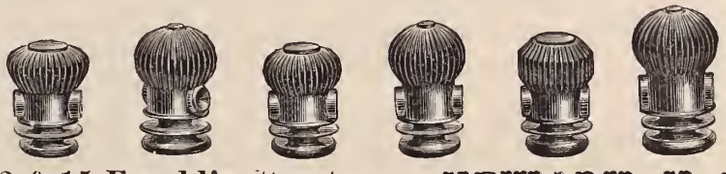
No. 12 Maiden Lane, New York.

The reputation of this Watch as an accurate timekeeper is fully established, and during the ten years that it has been before the Trade, has won an abiding reputation for fine Time-keeping qualities, and the BEST WATCH for the money in the world.

☞Send business card for price list.

MILNE & JOURDAIN,

Manufacturers of Stem-Winding Watch Crowns



13 & 15 Franklin Street, NEWARK, N. J.

Gold Crowns, for Stem-winding Movements, to suit all sizes of Imported or American Watches, in four different styles and seven sizes.

Gold Pushers for Key Movements in every size. Also Gold Crowns for fine Chronograph Watches made to order.

☞Silver Stem winding Crowns and Key Pushers on hand or made to order. Send for card and samples.

A. MILNE. A. JOURDAIN.

BERNARD LEVY,

Manufacturer of Watch Cases

—AND—

JOBBER OF AMERICAN MOVEMENTS,

No. 402 Library Street,

PHILADELPHIA.

ALSO, ORNAMENTAL ENGRAVER AND ENGINE TURNER.

Lubricating Oils, for Watch, Clock and Chronometer Makers.

The discovery of a Lubricator for FINE MACHINERY, such as Watches, Clocks and Chronometers, that is free from gum and corrosive substances, has taxed the ingenuity of hundreds of men whose efforts have proved a failure. But we are happy to say (being largely interested) that such an article has been supplied by MR. EZRA KELLEY, of New Bedford Mass., who, after forty years study of the subject, has perfected a Lubricator that recommends itself to all who have used the *genuine*, (there having been numerous counterfeits in the market) as witness also the award of a Diploma and Medal by the judges of the late Centennial Exhibition at Philadelphia. We have no hesitation in saying that his Oils are the BEST manufactured always uniform in quality and capable of standing all tests applied to lubricating oils. We cheerfully recommend it to all who may in their business require a FIRST-CLASS LUBRICATOR.







AMERICAN CLOCK CO., (Hine & Thomas.)

P. S.—The above Oils can be procured at all first-class wholesale Watch and Clock Establishments in the United States, as well as his only Agents, GRIMSHAW & BAXTER, 15 Goswell Street, London England.

New Bedford, October 15, 1877.

STERLING SILVER WATCH CASES.

HAVE WE A STANDARD FOR SILVER IN THIS COUNTRY?

WHEN WARES ARE REPRESENTED TO BE "SILVER," WHAT IS MEANT?

A Fixed and Universal Standard for Silver Wares Necessary.

It must be a High One to obtain Public Confidence!

The "Sterling" Standard Meets all Requirements.

It is Adopted by the American Watch Company

FOR SILVER WATCH CASES.

☞ STERLING SILVER WATCH CASES SOLD AS CHEAP AS THE DEBASED CASES OF OTHER MAKERS.

REDUCTION IN PRICES.

IT is but a few years since silver table ware was made of various qualities, from that of Sterling silver down to that base metal which the country spoon-maker said "was alloyed only one per cent."—one copper penny to a silver dollar. The results of this lack of a standard for the manufacture of silverware were the general debasement of the quality of the work, the discredit of the dealers, and an utter loss of confidence by the purchaser in the goods offered to him. The leading manufacturers of these goods, appreciating the necessity of winning back the confidence of the public, determined to redeem the reputation of silver table ware, and accordingly resolved to raise their standard to Sterling, and to keep it there. As they took pains to let the public know that there could be no swindle in the quality of the silver of which their goods were made, there was at once a demand for Sterling silver ware, and all manufacturers who did not follow their lead lost their trade and were heard of no more forever.

Now, we ask the dealers in watches if it is not just as imperative that there should be a high and fixed standard of silver in Watch Cases as in table ware? In fact, are there not many reasons why it is more important that Watch Cases should be of fine quality? Until recently the Silver Watch Case trade has been in exactly the same demoralized condition as was formerly the table ware trade described above. The highest quality recognized in silver cases was denominated "coin," meaning that it was of the standard value of United States coin, but without defining what particular "coin" was recognized as the standard. It might mean the three cent piece standard of coin, or the "dollar of our daddies." From the so-called coin standard, the quality of silver in watch cases ran down to the "one per cent. alloy," as defined by the country spoon-maker.

The consequence of this debasing of the quality of silver used in watch cases was that the public, having no guide to go by, and conscious of being swindled by unscrupulous dealers, lost confidence in all, and the trade necessarily became fearfully demoralized. This distrust of cases which the public entertained extended beyond the trade in cases, and seriously affected the business of the movement makers. People are apt to judge by outside appearances. When one finds flies in the crust of his pie, he is pretty sure to look with suspicion upon the "huckleberries" within. So the public, knowing they were being swindled in the quality of watch cases offered them by the trade, were suspicious that the movements contained in the deceptive cases were equally untrustworthy.

Finally, the American Watch Company, disgusted with the degraded condition to which the trade had sunk, resolved to make an honest and determined effort to restore it to public confidence. They accordingly determined to establish the "Sterling" standard for their silver cases, and that thenceforward, whoever should buy a Waltham silver watch case should have his money's worth; and in order that customers should know just the quality of silver they were buying, they stamped upon the inside of their cases the word "Sterling," together with their trade mark, "American Watch Company." While they thus fixed the highest standard for their cases, and guaranteed it by staking their reputation on its genuineness, they *did not advance the price of silver cases.* They simply resolved to deal fairly and honestly with the public and with the trade, by stamping their goods at their actual and precise value. This did not increase the cost of the cases to them—for their goods had always been of the highest quality—and, consequently, there was no occasion for them to advance their prices. What they did was to give every purchaser a satisfactory assurance that he was getting what he paid for—a "Sterling" Silver watch case. The reputation of the company was so high that all that was required was their simple guarantee that the cases were made by them and were of their standard make. This requirement was fulfilled by stamping on each case the word "Sterling," and their trade-mark.

Are dealers in watches aware of the fact that they can now buy a fine Waltham silver watch case of the best quality of workmanship, made of "Sterling" silver, and each case accompanied by the written guarantee of the American Watch Company that it is precisely what it purports to be, at just as low a price as the cheaply-made "three-cent piece quality" can be bought for.

In all markets of the world "Sterling" is the standard for silver. It is a good old Anglo-Saxon word, and, according to Webster, means genuine, pure, true, real, positive, substantial, It was first applied to coin in England, because the English coin had a fixed standard of value; it was something genuine, real, substantial. From this fact, the word "Sterling" has become a synonyme, wherever the English language is spoken, for all that is inflexibly good and trustworthy. Hence, it very properly represents the standard value of the American Watch Company's silver watch cases—they are "Sterling" in every particular, intrinsic value and workmanship. For this reason there is an increasing demand in foreign countries for Waltham watches, the quality of the cases being so fine and so trustworthy as to furnish, to a considerable extent, a guarantee of the quality of the movements they contain. Our own people may well take a hint from their transatlantic neighbors in this respect. While Americans are free to admit the superiority of the Waltham watches, they pay too little heed to the external covering of the movements. As a consequence, superior movements are often found in cheap cases made by other manufacturers, and lacking the trade-mark and guarantee of the American Watch Company. The silver of which such cases are composed may be of any quality, from "coin" of the three cent piece variety, to the "one per cent. alloy" previously alluded to. Such cases, independent of the watch, have but little market value, inasmuch as they contain vastly "more copper than conscience" The workmanship may be fair enough to look upon but the case itself, lacking the "Sterling" quality of purity and genuineness, is but a hollow mockery—a delusion and a snare.

Are Americans to remain content to wear in their pockets watch cases of a debased quality, while all foreigners reject anything below the "Sterling" standard? As we have shown, there is no necessity for their doing so. Genuine "Sterling" watch cases can be had for the same price as the cheap, unserviceable, fraudulent imitations. To get the genuine, and to be certain that they have got cases of superior quality of silver, manufactured and guaranteed by thoroughly reliable parties, purchasers have but to look inside for the word "Sterling" and the trade-mark of the American Watch Company.

OFFICE OF ROBBINS & APPLETON,

No. 9 BOND STREET, NEW YORK.

TO THE TRADE.

OCTOBER 5th, 1878.

AT the request of MESSRS. MATSON & Co., of Chicago, we prepared the following advertisement for publication in the Chicago papers :

WALTHAM WATCHES! ONE MORE STEP AHEAD! NEW MODEL WALTHAM WATCHES, improved in appearance and quality, but no higher in price.

The American Watch Co., of Waltham, Mass., is the only American Watch Company awarded the GOLD MEDAL at the PARIS EXPOSITION.

After an experience of many years in selling Watches of all grades, from the best makers, we have found none that have given such perfect satisfaction as the "Waltham," and unhesitatingly recommend the WALTHAM WATCHES as superior to all others.

Every WALTHAM WATCH sold by us is accompanied by our own guarantee, in addition to that of the American Watch Co.

CAUTION.—It having been demonstrated by frequent assays that many gold and silver cases offered in the market are greatly debased from the quality they assume to be, purchasers of WALTHAM WATCHES, to avoid imposition, should observe that every genuine watch, whether gold or silver, bears the trade-mark of the AMERICAN WATCH CO., on both case and movement. "Eighteen carat" gold, such as the WALTHAM cases are made of, is as nearly pure gold as can be made and be durable. It contains 750-1000 of pure gold and 250-1000 of alloy.

Sterling silver (English Government standard) contains 925-1000 of pure silver and 75-1000 of alloy.

We keep the most complete assortment of these Watches constantly on hand, and are prepared to furnish them at the lowest possible cost.

N. MATSON & CO.

The day following the first insertion of the foregoing card, the following extraordinary and incomprehensible statement appeared.

TO THE PUBLIC.

WE notice an advertisement in the morning papers of yesterday, appearing over our name, in relation to Waltham Watches.

Not taking the time to read over the copy, which WAS FURNISHED US BY THE AGENTS OF THE AMERICAN WATCH CO., we are therein made to say that we recommend Waltham Watches above ALL others.

We desire to correct this statement, as we regard the corresponding grades of the WALTHAM and ELGIN WATCHES of equal merit. N. MATSON & CO.

On inquiry of MESSRS. MATSON & Co., we received the following letter :

CHICAGO, September 26th, 1878.

TO AMERICAN WATCH COMPANY:

In our card of the 24th instant, in regard to WALTHAM WATCHES, we did not intend to imply that you were not authorized by us to advertise over our name. Our correction was intended in no way to reflect upon your agents, but rather upon ourselves in not reading over and correcting the copy furnished. While we regard the corresponding grades of the Waltham and Elgin Watches of like merit, the higher and finer grades of watches made by your Company cannot be brought into comparison or competition with any American made Watches for excellence.

Respectfully, N. MATSON & CO.

OUR friends will notice that MESSRS. MATSON & Co. distinctly acknowledge the superiority of our finer grades of Watches over ALL made in America. We leave those who inspired the publication of the senseless card, entitled "*To the Public*" to interpret what is meant by "we regard the *corresponding* grades of the Waltham and Elgin Watches of equal merit."

ROBBINS & APPLETON.

The following card from MESSRS. MATSON & Co. speaks for itself :—

TO THE PUBLIC:—

Since the appearance of the above advertisements in the Chicago papers we have not been recognized by the Elgin Watch Co., and consequently we shall not hereafter supply Elgin watches to our customers. We intended no unjust discrimination against them, but believe our judgment relative to the merits of Waltham and Elgin watches will be endorsed by every candid and competent watchmaker in this country. Respectfully, N. MATSON & CO.

Dorrance, Edge & Co.

MANUFACTURERS OF

THE CELEBRATED WOVEN FABRIC

GOLD CHAIN.

Elegantly Mounted Bracelets, Opera, Leontine,

VICTORIA WATCH GUARDS & NECKLACES, in all the Newest Designs.

☞Our stock is unusually complete, and, in addition to the above, a variety of Necklaces, from 1½ to 40 dwt. each, to which we invite the attention of buyers.

No. 9 John Street, New York.

Factory, 46 Greene Street, Newark, N.J.

Mathez Watch Company of New York.

Gents' and Ladies' Stem-Winding Movements

STRAIGHT LINE, 3-4 PLATE NICKEL.

These Movements are of six different grades, uniform in size and beautifully finished, and will be SOLD AT LOWER PRICES than any other goods of similar excellence.

☞A FULL LINE of materials for our movements always kept in stock for the convenience of those using our goods.

F. H. MATHEZ, Sole Agent,

No. 5 Maiden Lane, New York.

JULIEN GALLET,

Importer of Watches,

From his own Factory, Chaux de Fonds, Switzerland.

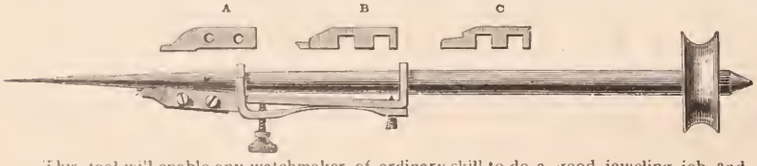
No. 25 JOHN STREET,

Leon L. Gallet,
Charles Perret,
Jules Racine.

NEW YORK.

Schwerter's Patent Adjustable Jewel Setting and Counter Sinking Drill.

WITH GROOVED ARBOR AND IMPROVED CUTTERS



This tool will enable any watchmaker of ordinary skill to do a good jeweling job, and in some cases in less time than it could be done with a lathe. The tool can also be used to make a variety of countersinkings by simply using different shaped cutters. **Price $6.**



This cut represents Schwerter's Patent Jewel Setting Opener, a very handy tool, which will in almost every instance open a closed jewel bezel without injuring it. ☞Price $1.25. On receipt of price these tools will be promptly forwarded to any address.

Address AUG. SCHWERTER, 51 Canal Street, N. Y.

☞A liberal discount will be made to dealers on orders of not less than ½ doz.



DEMMERT BROTHERS,

Manufacturing Jewelers,

STONE, CAMEO GOODS,

Colored and Etruscan Work

A SPECIALTY.



Old No. 9 Maiden Lane, New York.

Factory, 123 Railroad Avenue, Jersey City.

JOSEPH DEMMERT. FERDINAND DEMMERT.

HENRY HIRSH. EDWARD HIRSH.

HIRSH BROTHERS,

Dealers in Watches & Diamonds

AND MANUFACTURERS OF

JEWELRY,

No. 23 Maiden Lane, New York.

☞Prompt attention given to filling orders for all kinds of goods pertaining to the trade.

A. SALTZMAN,

Manufacturer & Importer of Fine Swiss Watches,



SOLE IMPORTER OF THE

AUGUSTE SALTZMAN
ALBERT VUILLE
} Watches

SPECIAL NOTICE.

The Trade is respectfully notified to beware of imitations of the name of Saltzman, marked on Watches of an inferior grade, and purporting to be the genuine Saltzman.

No. 15 Maiden Lane, New York.

T. B. BYNNER,

Importer & Jobber of Watches

DIAMONDS AND FINE JEWELRY,

And Dealer in the BEST CLASS OF ROLLED PLATE JEWELRY

And Key and Stem-Winding American Watches.

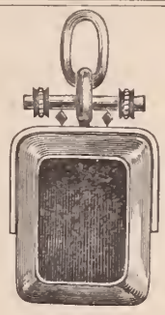
No. 513 Broadway, New York


3722


548


5096


532


3723

Manufacturing Jeweler,

HENRY C. HASKELL,

No. 12 John Street, New York.

NOVELTIES IN MOSAIC AND CAMEO SCARF PINS, LOCKETS, &c.

☞Write for samples "Gipsy" Rings, set with Diamonds, Rubies, Turquoise, &c.

Orders solicited for goods on approval. Stone Seal Engraving and Jobbing of every description promptly and carefully done at lowest prices.

NICOUD & HOWARD,



Importers of Fine Swiss Watches,

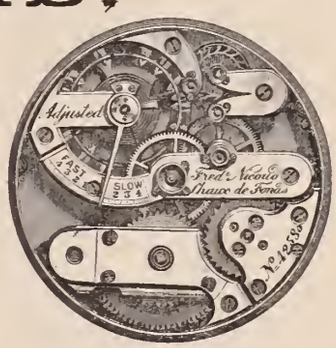
14 JOHN STREET, NEW YORK.

TRADE MARK.

NICOUD WATCH

N&H

Factory, 12 Rue St. Pierre, Chaux de Fonds, (Suisse.) Established 1847.



Sole Importers of the { Frederic Nicoud / Fred Nicoud & Son / Arnold Nicoud / Louis Nicoud } WATCHES.

☞*All Watches fully Warranted as to quality of Movements and Cases.*

SPECIAL NOTICE! MANUFACTURING JEWELERS, CHEMISTS, &c.

BROWN & BROS.,

No. 81 CHAMBERS STREET, NEW YORK.

Manufacture CHEMICALLY PURE COPPER for ALLOYING, and are prepared to fill orders for same, either in the Wire, Strip or Granulated form. Its PURITY has been attested as follows.

UNITED STATES ASSAY OFFICE, 30 WALL STREET,
NEW YORK, Dec. 21st, 1877.

BROWN & BROS.

Dear Sir.—We have analyzed the two samples of Copper left with us on the 18th instant, one said to be foreign refined Copper as used by jewelers, the other a refined Copper as manufactured by you for the same purpose. We find both samples alike in purity, and no difference can be detected by a careful chemical analysis, both being samples of PURE METALLIC COPPER, having no traces of antimony, tin, arsenic, zinc or lead.

TORREY & EATON.



BIRCH'S PATENT
Self-Adjusting Watch Keys.

WILL WIND ANY WATCH.

FOR SALE BY THE TRADE GENERALLY.



J. S. BIRCH & CO.,

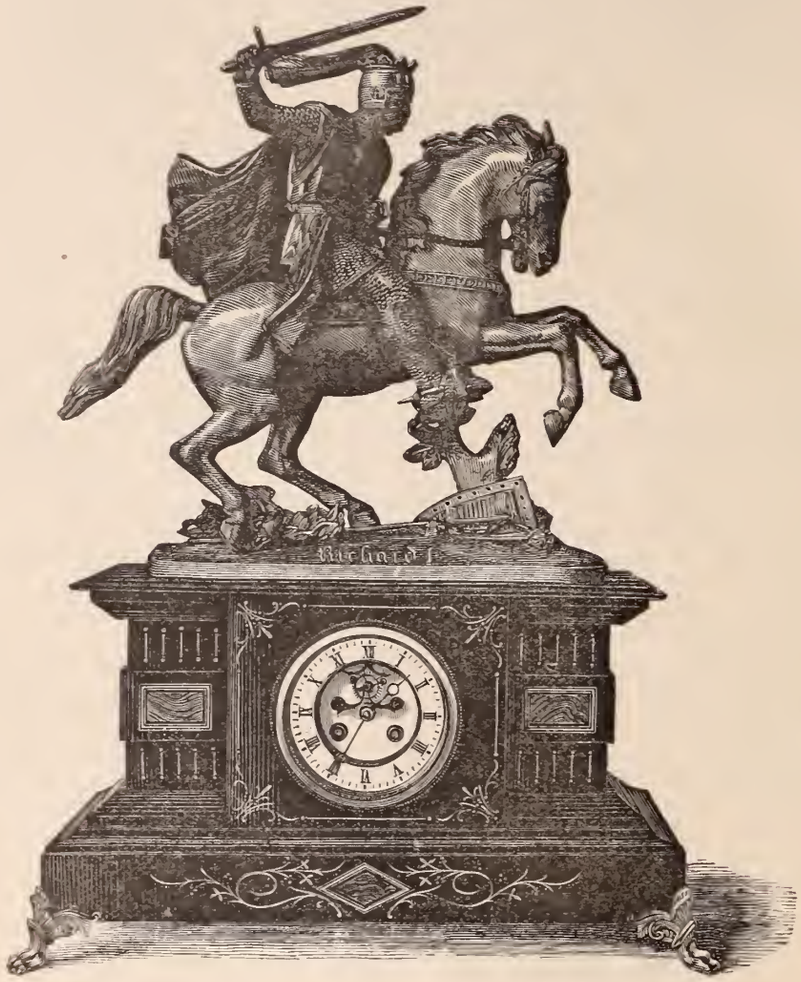
No. 38 Dey Street, New York

MARBLE

Clocks

FROM

$8.00 Upwards.



GILT

Clocks

FROM

$7.00 Upwards.

F. KROEBER,

Importer.

Marble Clocks,
Bronze Clocks,
Alabaster Clocks,
Gilt Clocks,
Bronze Figures.

No. 8 Cortlandt Street, New York.

☞ CATALOGUES FURNISHED UPON APPLICATION.

TO THE TRADE.

EXTRACT FROM LETTER OF E. W. TRASK,

Dated Aurora, Ill., September 28th, 1878.

MESSRS. NICOUD & HOWARD,

Gentlemen:

* * * * * * * *

It is my experience, and I find it is the experience of all the retail jewelers of my acquaintance, that the prospects of the **Swiss Watch** *business were never brighter for fine and medium priced goods. We cannot sell an American Watch to a railroad man if he wants anything above a very cheap grade.*

I think that the Americans have to a certain extent captured the trade, and perhaps will hold it on cheap goods, but for finer trade they are losing ground as fast as they can, and to give you my experience in this direction: a year or so ago we used to sell dozens of B. W. Raymond movements, and I have not sold one in the last nine months, and every one without a single exception to whom I have sold **NICOUD Watches** *is pleased, and I wish I could say the same of Walthams and Elgins.*

People are inquiring after better watches than they have been buying, and we have no trouble to sell fine **NICOUD Watches** *in place of cheap Americans, as the trade used to run.*

NICOUD & HOWARD,

SOLE IMPORTERS OF THE NICOUD WATCHES,

14 JOHN STREET, (P. O. Box 2269,) NEW YORK.

Fancy Goods.

We are pleased to inform the trade that since our removal from No. 10 Maiden Lane, to our present location, we have established a very large retail business among art connoisseurs.

Importing, for this clientile, many articles richer than generally shown by exclusively wholesale houses, we can offer to our customers many choice and unique designs not seen elsewhere.

A large proportion of the goods are from the Paris Exposition and will not be found duplicated in this market.

☞ *Our Prices will be as moderate for the above rare articles as for staple lines.*

As heretofore we can show a full line of

MARBLE CLOCKS.

LE BOUTILLIER & CO.,

Importers and Jobbers,

No. 3 Union Square, New York.

Hall, Nicoll & Granbery,

20 & 22 JOHN STREET, NEW YORK.

SUCCESSORS TO SCHUYLER, HARTLEY & GRAHAM,

In the Fancy Goods Department.

The finest display in the city of Fancy Goods, specially selected for the Wholesale Trade.

CLOCKS, BRONZES,

FAIENCES, POLISHED BRASS GOODS.

Several distinct lines of Goods suitable for **Jewelry and Fancy Goods Dealers' Trade,** *and each line complete.*

TRAVELING CLOCKS,
ODOR CASES, OPERA GLASSES,
JEWEL AND DRESSING CASES.

FOLDING TRIPLICATE MIRRORS.

The sale of these goods is constantly increasing and new styles are continually being added to the already large assortment.

Nos. 20 and 22 JOHN STREET, NEW YORK.

AMERICAN PEDOMETER.

Messrs. TIFFANY & CO. invite public attention to the AMERICAN PEDOMETER a remarkable invention of Mr. Benjamin S. Church, the well-known Engineer of the Croton Aqueduct.

This instrument accurately measures the distance a person carrying it walks, showing the amount of daily exercise taken in and out of doors.

It's mechanism is a marvel of simplicity, and can be adjusted to any length of step. It is strong and durable, and the size of a small watch. Ladies, Professional and Business Men, Students, Pedestrians, Sportsmen, Farmers, Surveyors, and others will find it very useful. A Table accompanies each Pedometer, giving the number of steps taken in a mile, second, minute, hour and day. Retail Price, $5.

Sidney E. Morse & Co., Makers.

TIFFANY & Co.

UNION SQUARE, NEW YORK.

SOLE AGENTS.

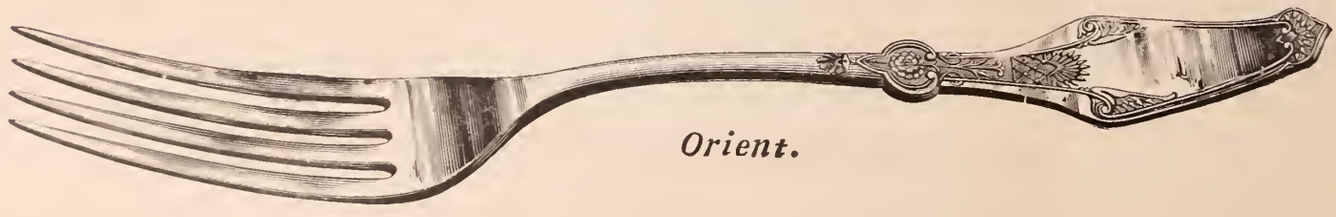
THE TRADE SUPPLIED AT WHOLESALE ONLY BY **TIFFANY & CO., 14 John Street, New York.**

REED & BARTON,

MANUFACTURERS OF

FINE SILVER-PLATED TABLE WARE

OF EVERY DESCRIPTION.



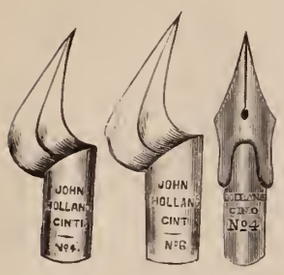
Orient.

☞Would call attention of the trade to their new design of fork (illustrated above) which we believe to be the finest design ever manufactured in plate. We are also manufacturing a great number of new designs in all kinds of hollow-ware, and among other things a great number of Fancy Pieces, such as Jewel Boxes, Card Stands, and Case Cologne Sets, etc., which are specially adapted to the holiday trade.

No. 686 BROADWAY, NEW YORK.

Factories, Taunton, Mass.

——Established 1842.——



JOHN HOLLAND,

Manufacturer of Patent "Record," Barrel, Falcon, Stub, and all styles of Long Nib Gold Pens.



Fine Solid Gold Pen and Pencil Cases, Pearl, Ivory and Fine Wood Pen Holders, Charm Pencils & Gold Tooth Picks.

No. 19 West 4th Street, Cincinnati, Ohio.



My goods are all made of the quality of gold stated, and finished in first class style. At the CENTENNIAL EXHIBITION the Judges on Awards gave me the HIGHEST AWARD for GOLD PENS, and stated in their report: "For great elasticity and general excellence of Gold Pens." The best quality of IRIDIUM is used on the points, and every pen is warranted.

As I MANUFACTURE all the above articles in my own building, and under my own supervision, I can guarantee quality and offer the trade special inducements in prices.

☞Handsome show-cases furnished for the display of goods. ☞Illustrated Catalogues sent free. ☞Goods sent on approval.
☞Special attention to repairing Pens and Pencil Cases.

L. HAMMEL & CO.,

Importers of Watch Materials, Tools



We would respectfully call your attention to our new design of an improved Spectacle Case which will doubtless commend itself to your favorable consideration. The improvement, consisting in the joint being on the top of the case, making it stronger and more durable than the old style of case, and the cut away for the insertion of the Spectacles renders it the most practical case made. These goods are made in all grades of leather and for all styles of spectacles, in price from $6 to $13.50 a gross, and stamped to order with name and address of the purchaser, at $2 per gross extra.

Samples sent by mail on receipt of 10 cents on application to

Opera Glasses and Optical Goods of Every Description

SPECTACLES, EYE GLASSES



☞ We would respectfully call the attention of the Trade to the celebrated **Star Spectacles and Eye Glasses,** of which we are the Sole Importers.

No. 9 Maiden Lane, New York.

☞Sole Agents in the United States for **G. B. Wheeler's Star Watch and Clock Oil,** and the Celebrated **Gravier Mainspring.**

LEO HAMMEL. LOUIS RUNKEL.



THE DUEBER WATCH CASE FACTORY, NEWPORT, KY.

TO THE JEWELRY TRADE!

No matter what other Manufacturers may say, we have a Copy of the Agreement between the Silver Watch Case Manufacturers, in which they admitted the Superiority of the

DUEBER

Coin Silver Cases!

Five Per Cent. Advance

Was all we asked, although they admitted their **Cases** would have **no show** at less than 7½.

The Dueber Watch Case Manf'g Co.

CINCINNATI, Ohio. CHICAGO, Illinois.

Vulcanite Jewelry Co.

MANUFACTURERS OF

WHITBY JET,

Combination Whitby Jet and Vulcanite,

Byron's Patent, May 18, 1869,

Also a full line of Lockets—plain, gold mounted and monogram.

No. 191 BROADWAY, N. Y.

☞ Agents for the NEW RUBBER WATCH CASES, Fitting all American Movements.

W. H. LUDEMAN,

Chronometer & Watch MAKER,

Nos. 75 & 77 Nassau Street,

NEW YORK.

☞ Repairing of every Description for the Trade.

FINE WATCHES A SPECIALTY.

To the Trade.—I am now prepared to cut all kinds of Stem-Winding Wheels for the Trade.

F. W. C. Nieberg,

Repairer and Adjuster of

FINE WATCHES,

and Marine Chronometers,

No. 8 JOHN STREET,

New York.

Blancard & Oberlander,

Manufacturers of all kinds of

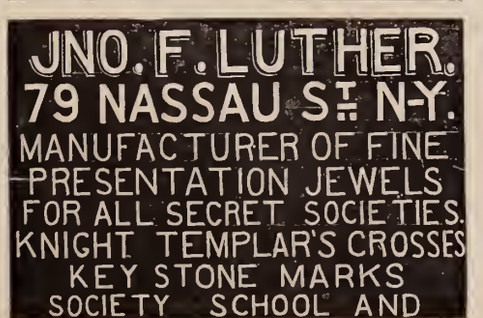
Settings & Galleries

Of any Carats of Gold, Silver or Platinum,

36 & 38 John Street, New York

We respectfully call attention to our Platinum-lined Settings, as we refine and melt Platinum ourselves. Platinum scraps purchased or exchanged. ☞ Please send for sample cards.





College Badges.

CHAS. T. MENGE,

MANUFACTURER OF

Fine Hair Jewelry

And Device Work,

No. 32 John Street, New York.

Pattern books constantly on hand, and will be sent upon receiving satisfactory references.

Patterns from any other hooks can be ordered from me by giving number of design and name of hook.

O. SCHWENCKE,

(Established over 30 years.)

[Successor to G. GUNZENHAUSER],

MANUFACTURER OF

Fine Hair Jewelry,

No. 43 MAIDEN LANE,

New York.

Solid Gold Mountings for Hair Jewelry, kept constantly on hand, and made to order at shortest notice.

Orders from the country trade promptly attended to.

VOSE & SOUTHWICK,

Manufacturers of Gold Jewelry



Sole Makers of the Separable Sleeve and Collar Buttons in Gold.

No. 183 Eddy Street, PROVIDENCE, R. I.

ALBERT FRIEDENTHAL,

Importer and Jobber of

WATCHMAKERS' & JEWELERS'

Materials, Tools and Optical Goods

Real and Imitation Stones,

☞ For Manufacturing and Repairing Purposes

A SPECIALTY.

Agent for TISDALE'S Watch and Clock Oils.

No. 43 Maiden Lane, New York.

Orders by mail will receive prompt attention.



The tool is made of Steel throughout, with the jaws and wearing parts hardened. Every part is made to guage. The finish is first-class and nickel-plated. Warranted to outwear at least three of the imported pin vises.

Offered in two sizes at $18 and $15 per dozen with liberal trade discount. Sold by the jobbing trade generally or by the

LOWELL WRENCH CO., WORCESTER, Mass.

McLane's Anti-Oxidizer.

A Solution for preserving and protecting the polish and color of gold and silver while under process of hard soldering.

The most delicate engraving and chasing is perfectly preserved from tarnishing when treated with this solution, and the article on which it is placed may be heated to a red heat without fear of discoloration. Price, 50 Cents per Bottle.

Sent by Mail, postpaid, on receipt of price.

☞ FOR SALE BY DEALERS IN WATCH MATERIALS.

This Solution is not intended to preserve acid color, but will, in a great measure protect it.

RICHARD OLIVER, 11 John Street, N. Y.

Established 1848. *Reliable and prompt.*

COOPER & BRO.

Wholesale Jewelers,

Importers and dealers in WATCH & CLOCKMAKERS' TOOLS and MATERIALS; also, JEWELERS' SUPPLIES, SPECTACLES, OPTICAL GOODS, &c. A complete Outfitting Establishment for the trade.

Repairs Department established 1865. Every description of work done for the trade. Watch Repairing, Jewelry and Watch Case Repairing, Gold and Silver-Plating, and Fire Gilding.

35 S. Fourth St. (1st floor), PHILADELPHIA



SHUT. OPEN.

CHAS. F. TERHUNE & CO.,

Manufacturers & Jobbers in General Jewelry.

No. 17 Maiden Lane, N. Y.

We beg to call the attention of the trade to the above cuts, representing MISSIMER'S PATENT SHOE, for the repairing of Sleeve Buttons. It is not separable, but works on a simple slide. Recommends itself at sight. Send for sample. A liberal discount to jobbers.

BOURQUIN BROTHERS,

Manufacturers and Importers of Watches,

All Kinds of WATCHES Made To Order.

NO. 20 MAIDEN LANE, N. Y.

FACTORY, BIENNE, SWITZERLAND.

DOWNEY & SMITH,

MANUFACTURERS OF

FINE JEWELRY,

No. 24 JOHN STREET,

NEW YORK.

Stone and Stone Cameo and Intaglio Goods.

RINGS, LOCKETS, SLEEVE BUTTONS, &c.

Deutsche Uhrmacher Zeitung.

[Organ des Central Verhandes der Deutschen Uhrmacher]

Expedition: 43 Markgrafen Strasse, Berlin W., Germany.

Redacteur: R. STACKEL, Hof-Uhrmacher.

Agent for the United States, H. HOREND, 15 Maiden Lane New York City.

who will give every information regarding Subscription and advertisements.

The Journal is noted for really practical and scientific articles and an abundance of information concerning the requirements in the art and trade of watchmaking. It appears fortnightly, and the great circulation of the same amongst watchmakers in all parts of Germany and German watchmakers abroad, secures for advertisements the best possible effects.

R. J. HERBERT,

24 John St., New York City,

(Joseph Wienhold's Office,)

Diamond Broker & Dealer,

Solicits attention of Dealers and general trade buyers.

MISCELLANEOUS STOCK. LOWEST POSSIBLE PRICES.

Goods sent and obtained for memorandum.

REFERENCES REQUIRED.

BERGSTEIN & SON,

Manufacturing Jewelers,

No. 20 John Street,

NEW YORK.

CHARLES KNAPP,

Engraver, Diesinker and Stamper

FOR JEWELRY PURPOSES.

Manufacturer of Shanks and Heads for Seal and Diamond Rings.

Sample Cards always on hand.

☞ Superior Carved and Fancy Band and Children's Rings, with very elaborate designs, a Specialty.

☞ Fine Engraving and Enameling Work done.

41 Maiden Lane, N. Y.

DAVID PRINCE,

Gold and Silver Refiner,

Assayer and Sweep Smelter,

63 RAILROAD AVENUE,

NEWARK, N. J.

Sole Agent for Comins' Improved Amalgamators

Mansard English Geneve Louis XV.



HENRY LEFORT,

Stem-Winding Watch Crown Manufacturer,

Crowns and Pushers in gold, all sizes, quality and color, made to order. Silver crowns and pushers always on hand.

☞ Samples sent on application.

80 & 82 Marshall Street,

NEWARK, N. J.

HENRY ZIMMERN,

IMPORTER OF

Watch Materials,

TOOLS, GLASSES, SILK GUARDS,

Spectacles & Eye Glasses,

No. 8 Maiden Lane, N.Y.,

FIRST FLOOR.

Sole Importer of the A. Hugenin & Gravier Mainspring

Solid Gold Rings.

TO THE TRADE

For the past twenty seven years I have made the manufacture of PLAIN GOLD RINGS a Specialty, and have given to every branch of the business my personal attention. I am, therefore, able to sell at the LOWEST CASH PRICES, and in every case guarantee the quality. I will send to any address, with proper reference, from 50 to 500 dwts, net cash, the goods to be returned if not found satisfactory. I also make Children's Rings, Silver Rings and Half-round Chased Rings. For uniformity, and the convenience of my customers, Allen's U. S. Gauge has been adopted as the standard in my manufactory. Parties desiring Single Rings can have them forwarded upon payment of 25 cents extra. Orders for all other jewelry filled at the Lowest Cash Prices. Old Gold received and refined, and $1.03 in gold allowed per pennyweight. Yours respectfully,

J. R. WOOD, Office, 14 John St. N. Y.

Particular attention paid to Remounting. Price list furnished on application.



Full line of new and original mountings on hand.

CHAS. F. WOOD,

169 & 171 BROADWAY NEW YORK

Engraver, Incruster of Precious Stones

And DIAMOND SETTER.

Incrusted Goods a specialty.

All kinds of Lapidary Work promptly executed.

Leon Jeanne. Paul Jeanne.

JEANNE BROTHERS,

MANUFACTURERS OF

DIAMOND MOUNTINGS

And RICH JEWELRY,

Patentees of Jeanne's Ear Wires,

No. 1 Maiden Lane, New York.

Designs furnished and estimates given.

KETCHAM & McDOUGALL,

No. 4 LIBERTY PLACE, NEW YORK.

MANUFACTURERS OF

Improved Gold and Silver

THIMBLES



AND THE PATENT

AUTOMATIC EYE GLASS HOLDER,

Which returns the Eye Glasses to their place on or under the lapel of the vest by simply casting them from the nose, combining all the conveniences of Cord, Hook and Case, without their annoyances.

J. B. LAURENCOT,

IMPORTER OF

WATCH GLASSES,

Optical and Fancy Goods

French Clocks, Musical Boxes, &c.

No. 33 MAIDEN LANE.

15 *Rue D'Enghien,* PARIS. *Box* 2954, *P. O.* NEW YORK.

L. BONET,

Medal at Centennial, 1876.

CAMEO Likenesses,

889 Broadway, New York.

Loehr & Koerner,

Manufacturers and Importers of

MOROCCO, VELVET, SATIN

Jewelry and Silverware Cases,

Rosewood and Black Walnut Trays,

No. 96 JOHN STREET,

NEW YORK.

EDMOND TYLER,

MANUFACTURING JEWELER,

No. 181 Broadway, New York.

SPECIALTIES:

STONE AND STONE CAMEO RINGS.

☞ Presentation Medals and Badges of all kinds made to order.

The Morse Diamond Cutting Company,

OF BOSTON.

NEW YORK OFFICE:

192 Broadway and 3 John Street.

J. D. YERRINGTON, Agent.

☞ Rough, Boart, Cabinet Specimens, Roses and Brilliants constantly on hand, and for sale.

☞ Fractured Diamonds repaired or recut for the Trade; also Rough Diamonds cut and fashioned to order.

W. N. WALKER,

DIAMONDS,

Watches and Jewelry,

No. 18 JOHN STREET, NEW YORK.

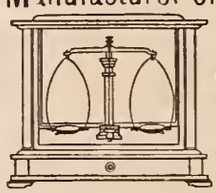
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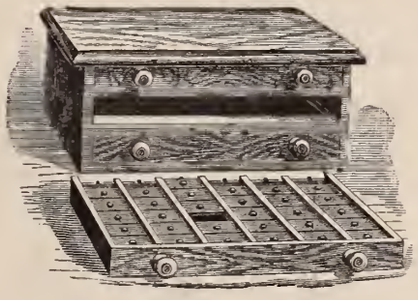
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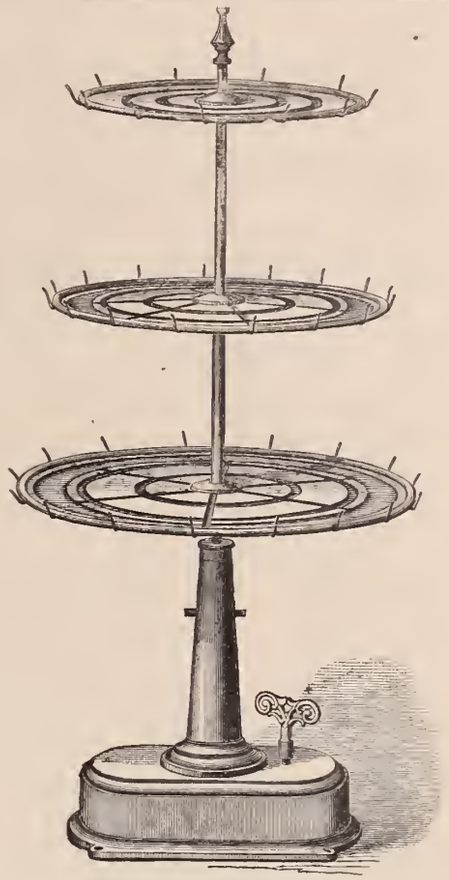
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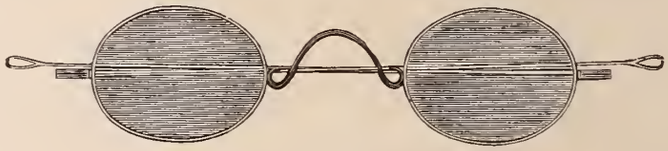
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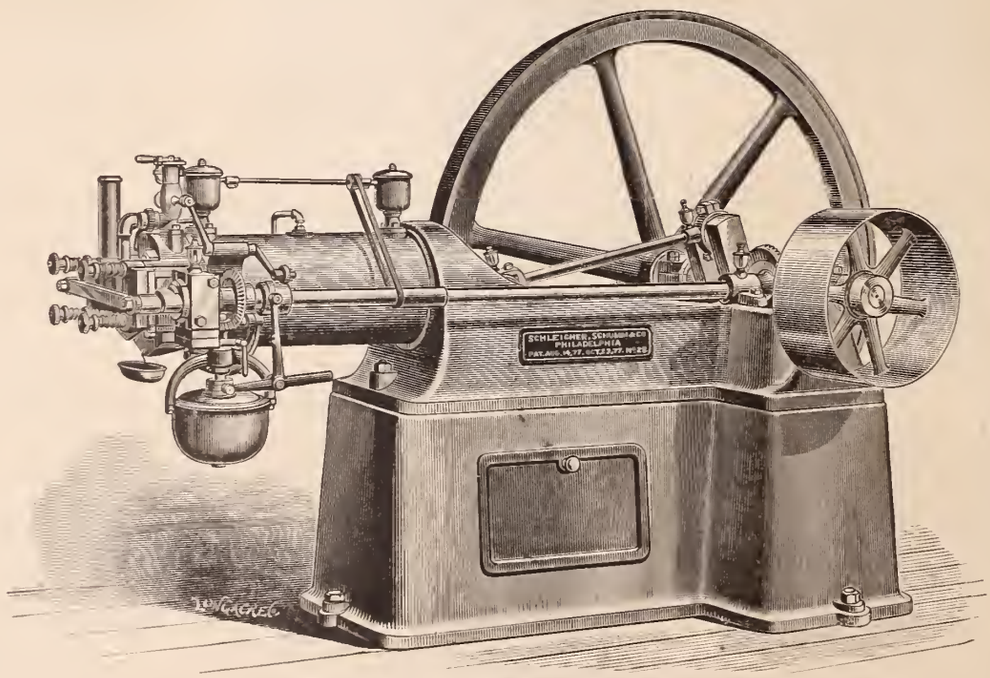
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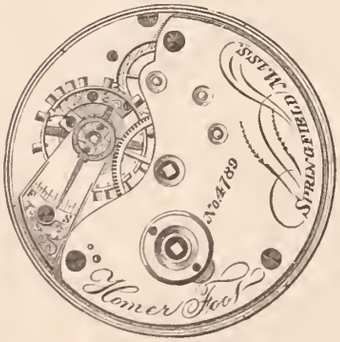
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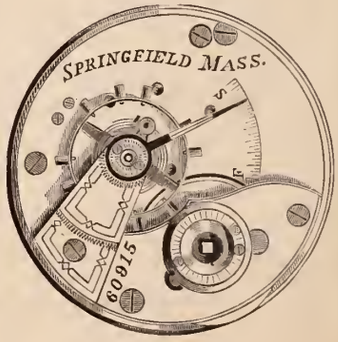
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Bernhard, A. & Co.,—Manufacturers of Fine Hair Jewelry and Device Work. The latest styles 169 Broadway, Room 3, New York.

Bergstein & Son,—Manufacturing Jewelers, No. 20 John Street.

Menge, Chas. T.—Manufacturer of Fine Hair Jewelry and Device Work. No. 32 John St.

Sauter, L.—Manufacturer of Fine Gold and Hair Jewelry and Device Work. Nos. 65 & 67 Nassau Street.

Schwencke O.—Manufacturer of Fine Hair Jewelry. Orders from the country promptly attended to. No. 43 Maiden Lane.

Jewelry Cases, Fancy Boxes, Etc

Braun, Chr. E.—Manufacturer of Jewelry Boxes, Trays for Show Cases, &c., 62 Chatham stt.

Dahlem, W.--Manufacturer of Cases for Jewelry and Silverware, No. 85 Nassau Street, N. Y Show Case Trays, &c., at the shortest notice

Wiggers & Froelick—No. 60 Nassau street.—Manufacturers of Cases for Jewelry, &c., of every description. Trays for Show-cases, Stands for Show-windows, etc. Jewelers' Traveling Cases, light, convenient and ong.

Jackson, Samuel C.—Manufacturer of Box and Trays, for Silverware, Watches, Jewelr &c. 180 Broadway, N. Y.

Sturn, I.—Manufacturer and Importer of C es for Jewelry, Watches, Silverware, &c.No. 15 John street, N. Y.

Welch & Miller—Manufacturers of Morocco, Velvet, and Satin Jewelry Cases, Trays, &c. Complete stock on hand. 169 Broadway.

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Aikin, Lambert & Co.—Manufacturers. General stock of Reliable Jewelry, 12 Maiden Lane.

Alford, C. G. & Co., Manufacturers. General line fine and reliable goods. Specialties in Onyx goods and chain. 183 Broadway, New York.

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Barthman & Straat—Manufacturers of Fine Jewelry. Seal and Stone Rings a Specialty Orders promptly attended to. 41 Maiden L

Bissinger, E. — Importer of Fine Jewelry, Lockets, Crosses, Neck Chains, &c., No. 192 Broadway.

Brown, Thos. G.—Manufacturer of Rich Jewelry Necklaces, Lockets, Bracelets, Sleeve Buttons, etc., 9 Bond street, N. Y.

Brainerd & Steele — Succcssors to Brainerd, Steele & Co., Manufacturers of Fine Jewelry and Brainerd's Patent Lockets. No. 9 Maiden Lane, New York.

Burch, Geo. & Co.—(Successors to Burch, De Mott & Coughlin,) Manufactnring Jewelers, 17 Maiden Lane, N Y. Factory, Newark, N.J.

Carrow, Crothers & Co.—Mannfacturers of Fine Jewelry, Roman Band Bracelets, Lockets, Crosses, &c. 12 John Street, N. Y.

Carter, Howkins & Sloan.—Manufacturing Jewelers, Whiting Bnilding, 4th St. & Broadway

Chatellier & Spence,—Manufacturing Jewelers. No. 652 Broadway, N. Y.

Coe, Pinneo & Stevens.--Manufacturers of Fine Jewelry, Fine Gold Lockets and Linen Finished White Enameled Goods a Specialty, No. 9 Maiden Lane, N. Y.

Chatterton & Dodd—Manufacturers of Fine Gold Jewelry, No. 19 John strect, N. Y.

Demmert Bros.—Manufacturers and Importers of Fine Jewelry, Cameo and Onyx Lockets, Sleeve Buttons and Sets a specialty. Old No. 9 Maiden Lane, New York.

Downey & Smith,—Manufacturers of Fine Jewelry. No. 24 John Strect.

Field & Co.—Manufacturing Jewelers, 8 Maiden Lane, N. Y.

Frankel & Folkart,—Manufacturing of Seal, Cameo and Amethyst Rings, a Specialty. Ladies' and Gents' Lockets, Cameo Sets, &c. Also a full line of Diamond Settings, 192 Broadway, cor. John street, N. Y.

Goddard, John M.—Manufacturing Jeweler,—Seal Rings and Fine Lockets a specialty, No. 25 Maiden Lane, N. Y.

Goldsmith & Schliesser,—Manufacturing Jewelers and Importers of Diamonds and Watches. No 5 Maiden Lane.

Greason, Bogart & Pierce, successors to Arthur, Rumrill & Co., 182 Broadway, manufacturers of fine jewelry and gold chains

Griffith, H.—Manufacturer of Fine Jewelry. Studs a Specialty. Nutry Alley, Adams near Concord St., Brooklyn.

Hartmann, P.—Manufacturer & Importer of Fine Gold, Diamond, and Filagree Silver Jewelry, No 36 Maiden Lane. P. O. Box 2,454.

Haskell, H. C.—Manufactnring Jeweler. Seal Rings a specialty. Special attention to Jobbing of every description. 12 John street.

Hunt & Owen.—Manufacturing Jewelers. Office, 5 Maiden Lane.

Hale & Mulford,—Manufacturers Rich Jewelry, Whiting Building, Broadway and 4th Street.

Jeanne Brothers.—Manufacturers of Diamond Mountings & Rich Jewelry. 1 Maiden Lane.

Keller, Chas, & Co.—Manufacturing Jewelers Lockets a Specialty. No. 13 John St., N.Y.

Krementz & Co.—Manufacturing Jewelers, No. 13 John Strect, N. J.

Kuhn & Doerflinger—Manufacturers of Enamel'd and Roman Band Bracelets, also Fine Lockets and Pendants, 18John street.

Lennon, John D.—Manufacturing Jeweler, 142 Fulton street. Flat, and Half-round Gold Bracelets, Roman and Stone Lockets.

Moore & Horton.—11 Maiden Lane, Manufacturing Jewelers, Rings, Studs, Collar and Sleeve Buttons, Pins, Ear-rings, &c.

Mitchell, Noah.—Manufacturer of Fine Gold Jewelry, 694 and 696 Broadway, N. Y.

Miller Bros.—Manufacturers of Fine Jewelry Lockets, Sleeve Buttons, Studs, etc., etc. 11 Maiden Lane, New York.

Mulford & Bonnet—Manufacturing Jewelers and Jobbers, 21 & 23 Maiden Lane, N. Y. Particular attention given to Jobbing and Special orders.

Maass, Cook & Groeschel—Manufacturers of Fine Jewelry and Lockets, 191 Broadway, (over Mercantile Bank,) N. Y.

Marx Kossuth & Co.—Manufacturing Jewelers. 39 Maiden Lane.

Owen, G. & S. & Co.—Manufacturing Jewelers. Office, No. 5 Maiden Lane.

Riker, William—Manufacturer of Jewelry. Inlaid Gold Jewelry a Specialty. No. 5 Maiden Lane, N. Y.

Riley, J. A. & Co.—Manufacturing Jewelers, Etruscan Gold and Coral Sets, Roman Bracelets, Necklaces, etc. Onyx Goods a specialty. 7 and 9 Bond street, New York.

Richardson, Enos & Co.—Manufacturers of Fine Gold Jewelry, Gold Chains, Lockets, Crosses and Necklaces. Colored and Etruscan Work. No. 23 Maiden Lane, New York.

Richardson, J. W. & Co,—Manufacturers of Jewelry, Masonic and other emblems. 196 Broadway, Manufactory, Providence, R.I.

Sexton & Cole—Manufacturing Jewelers, Colored Gold and Onyx Goods a specialty. No. 30 Maiden Lane.

Shoemaker & Co.—Manufacturing Jewelers, Cameo Buttons, and Lockets, Roman Gold Goods, etc. No. 21 Maiden Lane, N. Y.

Stites, E.—Manufacturer of Fine Jewelry. No. 12 Maiden Lane, N. Y.

Sturdy Bros. & Co.—Manufacturers of Jewelry, No. 14 Maiden Lane, New York.

Thoma, Ernest—Manufacturer of Fine Jewelry. Sleeve Buttons, Rings, Ear-rings, &c. No. 173 Broadway, N. Y. Factory, Hackensack, N. J.

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Wadsworth, E. E.,—Manufacturer of Rich Jewelry and fine Rolled Plate. Fine Seal Rings a specialty. 35 Maiden Lane.

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Wienhold, Joseph—Manufacturer of Fine Jewelry and Diamond Setter. 24 John St.

Woglom & Miller —Manufacturing Jewelers, Nos. 32 & 34 John street, N. Y. Specialty, Black Onyx goods.

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Celluloid Novelty Co.—Manufacturers of Imitation Coral Jewelry, 4 Maiden Lane.

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Brown, Edwin — Lapidary. Manufacturer of Glasses, for all kinds of Jewelry, Clocks, Chronometers, &c. Glasses bent to any shape. No. 85 Nassau st.

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Dennison Mfg. Co.—Manufacturers of Jewelers Findings, Paper Boxes, Cards, Tags, Cottons, Tissue Papers, &c., 198 Broadway, N. Y.

Frasse & Co.—Importers of Stubs, French, Swiss, German and Sheffield Tools, Files and Steel Wire for Watchmakers, Jewelers, etc., 62 Chatham street, N. Y.

Hammel, L. & Co.—Importers of Materials and Tools for Watchmakers, Jewelers and Engravers—also Optical Goods, &c., 9 Maiden Lane, N. Y.

Zimmerr, Henry—Importer of Watch Materials, Tools, Glasses, Silk Guards, Silver & Plated Chains, Optical & Fancy Goods, 8 Maiden L

Lapidaries.

Kordmann & Michel—Lapidaries, dealers in Precious Stones. Rubies, Sapphires and Peridots cut. No. 32 Maiden Lane.

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Paillard, M. J. & Cc—Importers & Manufacturers of Musical Boxes, No. 680 Broadway, N. Y.

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Suttie, Wm. J.—Manufacturer of Eye Glasses and Spectacles, in gold, silver, steel and shell, (Price List by mail). 39 Maiden Lane.

Precious Stones, &c.

Bissinger, Philip—Importer of Diamonds, Pearls and Precious Stones. Agent for the Bohemian Garnet Goods. No. 22 John St., N.Y.

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Meyer, Francis Ed. —Successors to John B. Behrmann, Importer of Imitation Precious Stones, all sizes and shapes constantly on hand. No 38 Dey street, P.O. Box, 1981.

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Gorham Manufacturing Co.—Union Square.

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Wood & Hughes.—Manufacturers of Fine Silver ware. 14 John Street, N. Y.

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Silver Plated Ware.

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Meriden Britannia Co—Manufacturers of Silver plated Ware, Union Square, N. Y.

Middletown Plate Co.—Manufacturers of Superior Electro-Plate. Factories, Middetown, Conn., Salesroom, 13 John Street

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Reed & Barton—Manufacturers of Fine Plated and Table Ware, of every description, 686 Broadway, N. Y.

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American Watch Co.—Robbins & Appleton, No. 9 Bond street, N. Y.

Hampden Watch Co.—of Springfield, Mass. Office, No. 12 John St., New York.

Springfield Watch Co.—Factory, Springfield, Ill. Office, 11 Maiden Lane.

Tiffany & Co.—Makers of Fine and Complicated Watches. Office 14 John street, N. Y.

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Queen, James—Watch and Chronometer Jeweler and Pallet Maker, 78 Nassau street, Room 8. Pivots inserted in Pinions, Balance, Staffs, &c.

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Bodine, G. M.—Importer and Dealer in Watches and Jewelery, etc., also Agent for Bard & Bros.', Gold Pens & Pencils, 22 Maiden Lane.

Bourquin Brothers—Importers of Watches from their own manufactory at Bienne, Switzerland, 20 Maiden Lane, N. Y.

Bynner, T. B.—Importer and Jobber of Watches, Diamonds and Fancy Goods, and dealer in the best class of Rolled Plate Jewelry. 513 Broadway.

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Gallet, Julien—Importer of Watches. No. 25 John Street.

Cross & Beguelin—Importers of Watches, Watch Tools and Materials, dealers in American Watches, No. 21 Maiden Lane, N. Y.

DuBois, Francis & Co.—36 Maiden Lane, N. Y., Importers of Watches and Manufacturers of Watch Cases.

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Freund Max & Co.—Importers of Watches Jewelry and Precious Stones, 8 Maiden Lane

Ginnel, Henry—Importer of Watches, Tools and Materials. No. 31 Maiden Lane, N. Y. P. O. Box, 2967

Keller, L. H. & Co.—(Successors to G. A. Huguenin,) Importers of Fine Watch and French Clock Materials, No. 64 Nassau street, N. Y.

Hyde's Sons, John E.—Wholesale Commission Agents only, for Jules Jurgensen, of Copenhagen, Ed. Perregaux, Locle, Monard Freres, Geneva, Watches, and of other makers of every quality. No. 22 Maiden Lane

Kahn, L. & M.—Importers of Watches, No. 10 Maiden Lane, New York.

Mathez, F. H.—Importer of Watches. No. 5 Maiden Lane, N. Y.

Magnin, Ve J. Guedin & Co.—Importers and Agents of the Nardin Watch, No. 652 B'way

Mathey, L. & A.—Importers of Fine Watches and Sole Agents for the **H. L. Matile's** Watches, No. 119 Fulton Street, N. Y.

May & Stern—Importers of Foreign Watches, Materials and Tools, etc. Manufacturing Jewelers. No. 19 John St., N. Y.

Nicoud & Howard,—Importers and Manufacturers of Watches, No. 14 John street, N. Y.

Oppenheimer Bros. & Veith, Dealers in Watches and Diamonds, and Manufacturing Jewelers. No. 35 Maiden Lane, N. Y.

Quinche & Krugler.—Agents for the Borel & Courvoisier Nickel Movements, 17 Maiden Lane, N. Y.

Robert, J. Eugene—No. 30 Maiden Lane, New York Agent for Louis Audemar's celebrated watches.

Schwob, Adolphe—Manufacturer & Importer of Watches, 11 Maiden Lane, N. Y.

Saltzman, A.—Manufacturer and Importer of Fine Swiss Watches, 15 Maiden Lane, (up stairs,) N. Y. Factory, Chau de-Fonds, Switzerland.

Stern Brothers & Co.—Importers of Swiss Watches and wholesale dealers in American Watches, &c., 30 Maiden Lane.

Scott, J. T. & Co.—Importers of Watches, and Manufacturers of Jewelry, and Jobbers of all grades American Watches. No. 11 Maiden Lane, N. Y.

Strasburger, Louis & Co.—Importers and Makers of Watches of every description. No. 15 Maiden Lane.

Tiffany & Co.—Makers of Watches. General Agents for Patek, Phillippe & Co. Wholesale office, 14 John street, N. Y.

Watch Cases.

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Glatz, Charles—Manufacturer of Gold and Silver Watch Cases. 12 Maiden Lane.

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Bennett, Jacob & Son,—Diamond Setters and Manufacturing Jewelers. 108 South 8th St., Philadelphia, Pa.

Cooper & Bros.—Wholesale Jewelers, and Importers of and Dealers in Watch and Clockmakers' Materials, etc. Spectacles and Optical Goods. No. 35 South 4th St., Phila.

Conover David F. & Co.—American Watches, Wholesale Salesroom, southeast corner 7th and Chestnut streets, Philadelphia.

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Kolb, G. F. & Son.—Manufacturer of fine Morocco, velvet and Cabinet Cases for jewelry watches and Silverware. 722 Sansom street.

Krider, Peter L.—Manufacturer of Sterling Silver Ware, Artisan Hall, No. 618 Chestnut street

Levy, Bernard—Manufacturers of gold and silver watch cases, and importers and dealers in Swiss and American watches, 402 Library street, Philadelphia.

McCall & Newman—Manufacturing Jewelers, Filled Plain Gold Rings a specialty, No. 625 Arch street.

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Pierson, Edward,—Manufacturer of Fine Imitation Jewelry, Gold and Silver Electro-plater, Fire Gilder, Coloring, Etruscan and Gold Jewelry a specialty. 1223 Chestnut St.

Rosenthal, G. F. C.—Manufacturing Jeweler and Diamond Setter. Engraving and Designing of Monograms a Specialty. No. 924 Chestnut street, Philadelphia.

Scherr, L. A. & Co. Wholesale Dealer in Watches Silver Plated Ware, Spectacles, Fancy Goods, Watch Materials, etc., 726 Chestnut street.

Sheafer, W. H. & Co.—Makers of Fine Jewelry 908 Chestnut Street.

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Lelong, L. & Bro.—Gold and Silver Refiners, Assayers and Sweep Smelters, S. W. corner Halsey & Marshall streets, Newark, N. J.

Milne & Jourdan—Manufacturers of Stem-winding Watch Crowns Nos. 13 & 15 Franklin Ave., Newark, N. J.

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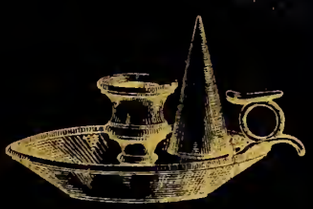

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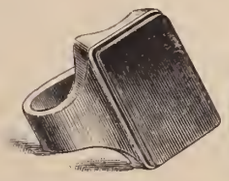

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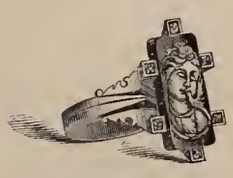

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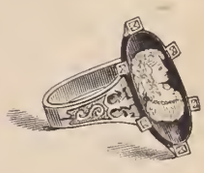

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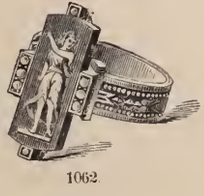
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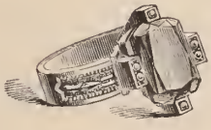

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3256.


5024.


1360.


5336.


3719.


3786.


3774.

2782.

2129.

2277.

2127.

3718.

3274.

3933.

3099.

4877.

EXAMPLES OF GOODS MANUFACTURED BY HENRY C. HASKELL, 12 JOHN ST., NEW YORK.



French Clocks, strlke, visible escapement, from $20.00 upwards.

ALBERT BERGER & CO.

IMPORTERS OF THE

W. B. & Co. Watch Glasses, Spectacles,

FRENCH CLOCKS, REGULATORS, MUSICAL BOXES, &c.

☞ *Also Lemaire & Bardour & Sons' Opera and Field Glasses.*

No. 47 Maiden Lane, New York

Factory at Goetzenbruck, Lorraine.

No. 21 Hatton Garden, London. No. 27 Rue-Paradis-Poissonniere, Paris.

F. P. LOCKLIN,

MANUFACTURER OF

GOLD and SILVER-HEADED

Walking Canes

JEWELRY, &c.

FACTORY,

142 Fulton Street, New York

Between Broadway and Nassau street.

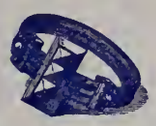
— ESTABLISHED 1837.—

GEO. O. STREET & SON,

Makers of Fine Jewelry

126 Kearny St. 15 John Street,

San Francisco, Cal. NEW YORK.





We would respectfully call attention to our PATENT EXTENSION RINGS and BRACELETS. They are strong and durable; there are no snaps and joints to get out of order; are easily expanded to admit the hand or fingers, and as easily closed by a slight pressure on the finger guides on the side.

Stone Cameo Goods, Rings, Etruscan Work, &c.

EXCLUSIVELY OF OUR OWN MAKE.



In placing these Oils before the Trade, we do so with entire confidence, from many years' experience in procuring them from the fish, and in their preparation for use, and more than all, the thorough and SEVERE TESTS they have been subjected to in use upon Chronometers in our whale ships, often absent from fifty or sixty months. ☞ Liberal samples furnished on application.

AGENTS—Cross & Beguelin, 21 Maiden Lane, New York; Kearney & Swartchild, 147 State street, Chicago; Glickauf & Newhouse, 120 Sutter street, San Francisco; Bowler & Burdick, 208 Superior street, Cleveland, Ohio; Heeren Bros., 30 Fifth avenue, Pittsburgh, Pa.; Louis A. Scherr & Co., 726 Chestnut street. Philadelphia; Wm. Bond & Son, 97 Water street, Boston; Robert Haswell & Son, 49 Spencer street, London.

HENDERSON & WINTER,

MANUFACTURERS OF

FINE GOLD JEWELRY

No. 15 Maiden Lane, New York.

SPECIALTIES.

STONE CAMEO, ONYX, AMETHYST, TOPAZ, PEARL AND TURQUOISE RINGS.

HENRY MAY. Established 1854. JOSEPH STERN.

MAY & STERN,

IMPORTERS OF

Foreign Watches, Materials and Tools

AGENTS FOR THE SALE OF ALL

DOMESTIC MOVEMENTS AND CASES.

And MANUFACTURING JEWELERS

No. 19 John Street, New York.

☞ **SOLID GOLD SEAL RINGS, in Cameo, Amethyst, Topaz and Onyx, A SPECIALTY.**

L. LELONG & BROTHER,

GOLD & SILVER REFINERS,

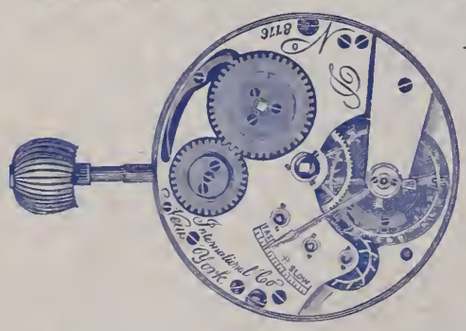
Assayers and Sweep Smelters,

S. W. Cor. Halsey & Marshall Streets,

NEWARK, N. J.

SWEEPINGS A SPECIALTY.

KELLER & UNTERMEYER,



AUTHORIZED AGENTS FOR THE SALE OF THE

INTERNATIONAL WATCH CO.'S WATCHES.

☞ A full and complete assortment of these goods in new and attractive Cases constantly on hand.

No. 18 John Street, New York.



P. HARTMANN,
JEWELER AND SILVERSMITH,
86 MAIDEN LANE,
NEW YORK.

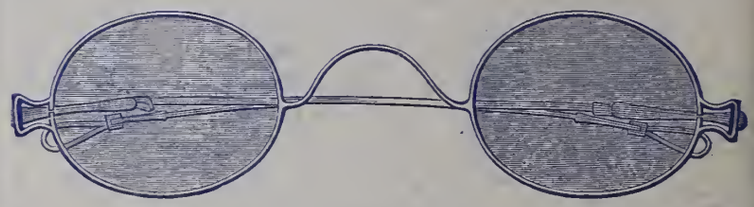
ALBERT LORSCH,

MANUFACTURER OF

PATENT ACCOMMODATING

Spectacles and Eye Glasses,

In Gold, Silver, Steel, &c.



Also Latest Novelties in Fine WATCHES & JEWELRY.

PRICES REDUCED TO SPECIE BASIS.

☞ I would call especial attention that with the above Spectacles and Eye Glasses it is only necessary to have one complete assortment of the different kinds of lenses, which being of uniform size, will interchange in all the different kinds of frames, thus giving a complete assortment for a comparatively small outlay

ALBERT LORSCH, 37 Maiden Lane, New York.

LORSCH BROS., 120 Sutter St., San Francisco, Cal.

L. & M. KAHN,

IMPORTERS OF

Sole Agents for James Kahn, E. Bourquin & Fils AND Alphonse Matile WATCHES.

WATCHES

112 Kearny St. San Francisco, CALIFORNIA.

5 Rue des Alpes, Geneva, SWITZERLAND.

No. 10 MAIDEN LANE,

NEW YORK.

☞ *Manufacturers of the* EAGLE TIMER! *the Best in the market.*

E. Steger 25 Park Place

Volume IX. No. 10
NOVEMBER, 1878.



JEWELERS' CIRCULAR.

D. E. HOPKINSON, PUBLISHER.

42 NASSAU STREET, NEW YORK.

American Clock Co.

581 BROADWAY, NEW YORK.

REGULATOR No. 10.



No. 172 State Street, Chicago.

No. 7 Montgomery St., San Francisco.

SOLE AGENTS IN AMERICA FOR

E. N. Welch M'f'g Co. **New Haven Clock Co.**

Seth Thomas Clock Co. **Welch, Spring & Co**

Seth Thomas, Sons & Co.

A. S. Hotchkiss' Tower Clocks,

(Made by the Seth Thomas Clock Co.)

A NEW SETH THOMAS

REGULATOR.

14 Inch Dial. Engraved and Silvered.

8 Day Time Weight. 68 Inches High. 21 Inches Wide. 9 Inches Deep.

The Seth Thomas Clocks are to be seen at the Paris Exposition, and are in care of Mr. Louis Ritz.

SETH THOMAS.

"NUTMEG" LEVER,
Front. Back.





30 Hour Nutmeg, Brass.
30 Hour Nutmeg, Nickel.

A Small Lever Time-piece

WINDS, SETS AND REGULATES

AT THE BACK.

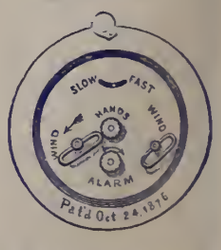
HANGS UP OR STANDS UP.

WINDER ATTACHED TO CLOCK.

Scale, One-Quarter Size, 3 inch Dial.

"NUTMEG" ALARM LEVER.
Front. Back.





30 Hour Nutmeg Alarm, Brass.
30 Hour Nutmeg Alarm, Nickel.

AMERICAN CLOCK CO., (Hine & Thomas.)

Ansonia Clock Company,

MANUFACTURERS OF AMERICAN CLOCKS,

And IMPORTERS of CLOCKS of EVERY DESCRIPTION.

SALESROOMS: 19 & 21 CLIFF STREET, and 5 CORTLANDT STREET, (Near Broadway NEW YORK.

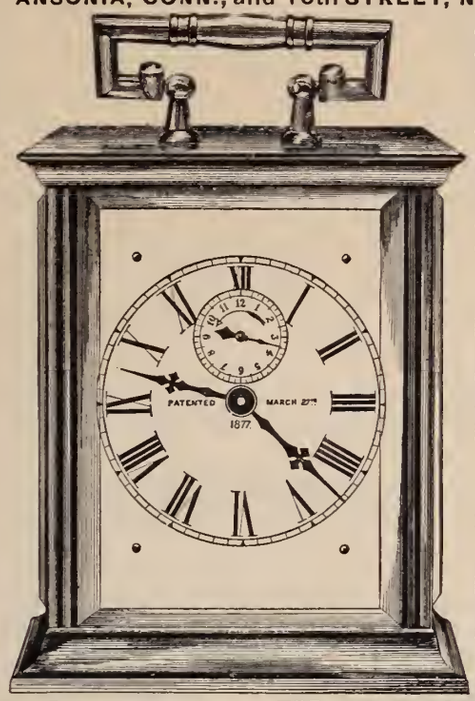
FACTORIES ANSONIA, CONN., and 10th STREET, NEW YORK.



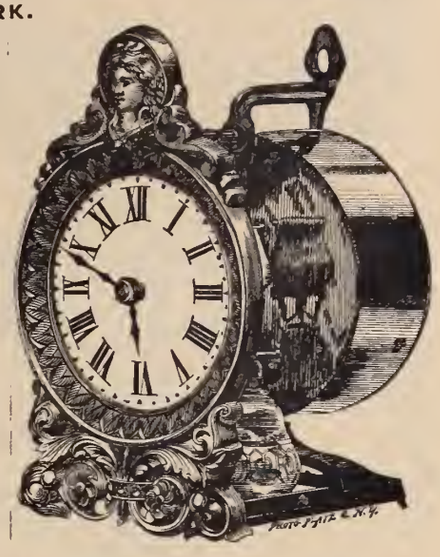
Peep O'Day Alarm.

One-half the size: Stem-Winding: Sets the alarm and winds at the back. "Only requires one spring" to be wound, and will go in any position.

Nickel or Gilt. CARRIAGE. Stem-Winder.



One Day Time, Alarm. No. 1, height, 5¼ in. Eight Day Time. Only one spring to wind. No. 2, height, 4¼ in. No. 3, height 3¼ in.



Aladdin Night Light, Extra.

Nickel and Gilt. Stem-Winder. Patented November 1, 1877. One Day Time. Four inch dial. Height, 7 inches.

The above are excellent Time-keepers. Illustrations and prices on application.

A NEW LINE OF NOVELTIES WILL SHORTLY BE OFFERED.

Waterbury Clock Comp'y

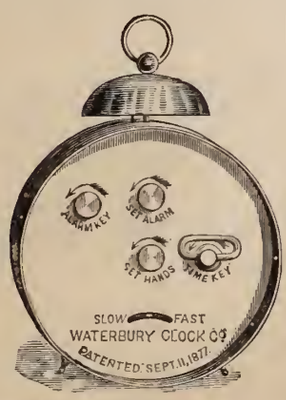
MANUFACTURERS OF AMERICAN CLOCKS,

No. 4 Cortlandt Street, New York. No. 197 State Street, Chicago.

Factories, - Waterbury, Conn.

M. BAILEY, Treas.





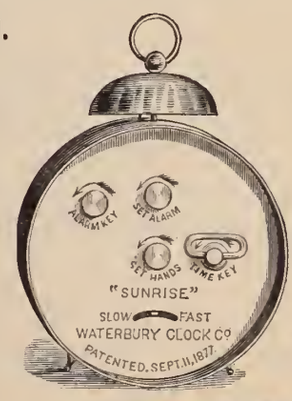
"MONITOR."

30 Hour Lever Time, Alarm Calendar.



"CRICKET."

30 Hour Lever Time.





"SUNRISE."

30 Hour Lever Time, Alarm.

☞ **Are Stem-Winders, No Keys Required, Reliable Time-Keepers, Will Run in any Position, Separate Alarm Spring Set and Regulate at the Back. Nickel-Plated Cases.**

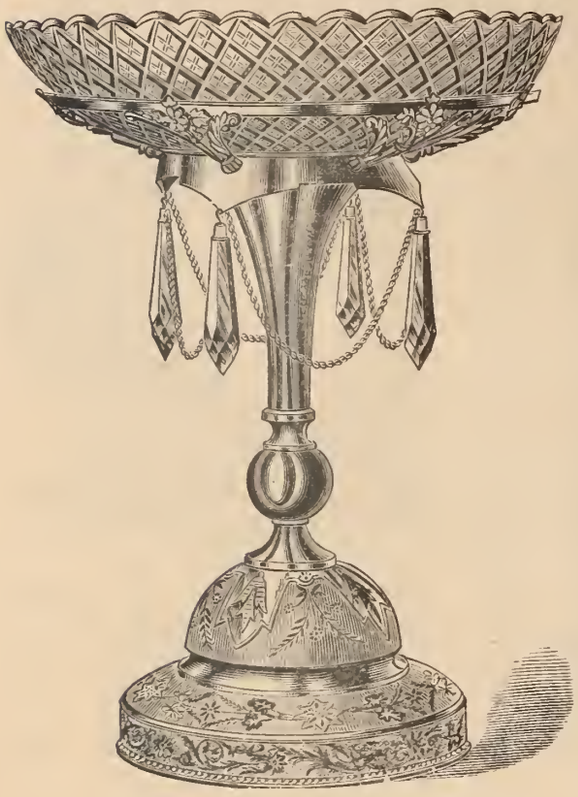
SOLE AGENTS FOR THE ITHACA CALENDAR CLOCK COMPANY.

Illustrated Catalogues and Price Lists furnished to the Trade upon application.

SIMPSON, HALL, MILLER & CO.

Manufacturers of Fine Silver-Plated Ware,

Factories. Wallingford, Conn. Salesroom, No. 676 Broadway N. Y.



One of the oldest and most reliable manufactories in the country.

Our assortment includes a large and complete line of Hollow Ware, comprising many new and beautiful designs especially produced for the Holiday trade. The attention of the trade is particularly called to these new articles which possess the highest merits, both of construction and ornamentation. Many novelties have recently been added to our line.

Our Solid Table Ware is made of the best Nickel Silver.

SPOONS, FORKS, LADLES, PIE KNIVES, &C.

In great variety of Patterns.

Solid Steel Knives of Superior Quality.

PATENT BUTTER DISH.

Our patent Butter Dishes are unrivalled in originality, utility, and general elegance of appearance.

NOTE.—We have just issued an illustrated catalogue of our wares, which has been in preparation for several months. This book we will furnish to dealers on application.

DAVID F. CONOVER & CO.,

(SUCCESSORS TO WM. B. WARNE & CO.)

Importers, Manufacturers and Wholesale Dealers in

WATCHES AND JEWELRY,

Silver and Silver-Plated Ware,

AMERICAN WATCH WHOLESALE SALESROOM,

Southeast Corner Chestnut and 7th Sts.,

(FIRST FLOOR.)

DAVID F. CONOVER,
B. FRANK WILLIAMS,
C. EDGAR RICHTER.

PHILADELPHIA, PA.







Mabie, Todd & Bard,

Manufacturers of

GOLD PENS,

Pen Holders, Pencil Cases and Tooth Picks,

in Gold Mounted Rubber, Pearl, Ivory and Solid Gold,

180 Broadway, **New York.**









We were awarded a Medal & Diploma, at the Centennial Exhibition, for excellence of designs, and high quality of workmanship.

Illustrated Catalogues and Price Lists sent to the trade upon application.

LOUIS STRASBURGER & CO.

Manufacturers of Watches,

(From the finest Stem-Winding and Setting goods to the lowest price Watch in the market.)

And Importers of Diamonds.

We manufacture and have continually in stock a complete assortment of the best COMMERCIAL WATCHES, ranging from the lowest priced Metal and Silver Watches to the finest Gold Watches, including *Repeaters, Chronographs, Timing and other Complicated Watches.* Also specialties in all grades of NICKEL WATCHES and CASES. ☞Gold and Silver Cases constantly on hand.

☞A full assortment of the *International* and all American Movements.

LOUIS STRASBURGER & CO.,

Salesrooms, No. 15 Maiden Lane, New York.

Diamond Bureau,
No. 30 Boulevard Haussmann,
Paris.

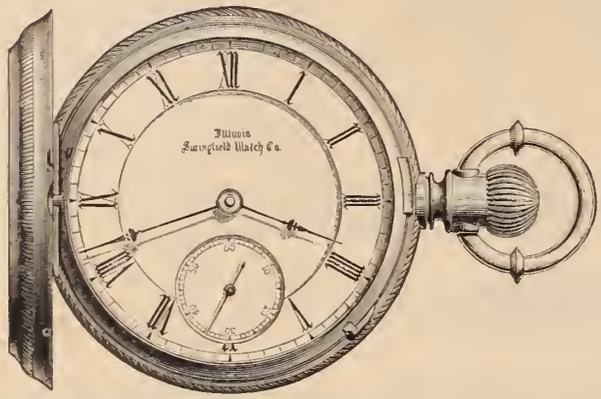
Watch Factory,
Rue Leopold, Chaux de Fonds,
Switzerland.

ILLINOIS

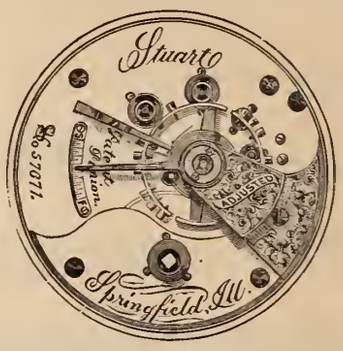
Springfield Watch Company,

MANUFACTURERS OF

KEY AND STEM-WINDING MOVEMENTS.



"STUART."

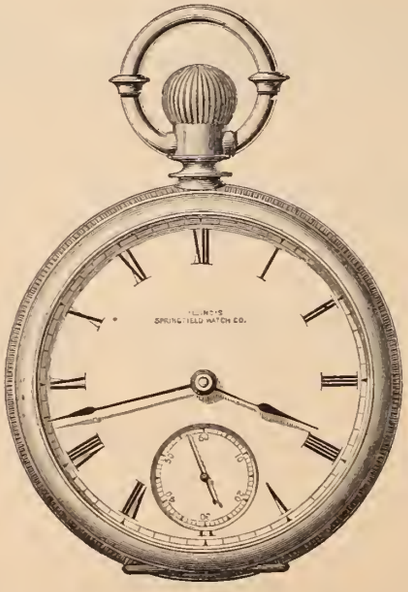


Reverse of Movement.

The above is a fac-simile of the finest grade of 18 Size Watch made by us. The first cut shows the **Improved DOUBLE SUNK, Old English Lettered Dial,** *and its appearance when cased. The movement is finely adjusted to heat, cold and isochronism, and is guaranteed to be as fine a time-keeper as is made in this country in 18 Size.*

OPEN FACE STEM-WINDERS.

"Columbia," "America" *and* **"Interior" Stem-winding Movements** *made especially for* **Open Face Cases,** *with* **Fig. XII** *at the pendant and* **Seconds** *opposite.*



Other *Stem-winding grades on our list are made to order (in 4 to 6 weeks) in the same manner, in quantities of five or more of a grade.*

The extra plate hole is jeweled in all grades, Currier and above.

OFFICES.

11 MAIDEN LANE, NEW YORK. SPRINGFIELD, ILLS.

"LA REINE,"

THIRTY HOUR LEVER TIME.

THE

MOVEMENT

IS PROTECTED AT

FRONT and BACK

—BY—

CLOSE FITTING

CAPS,

SO THAT THE

DUST CANNOT GET IN.

THIS CLOCK

WILL RUN IN

ANY POSITION.

HAS A FINE

NICKEL MOVEMENT.

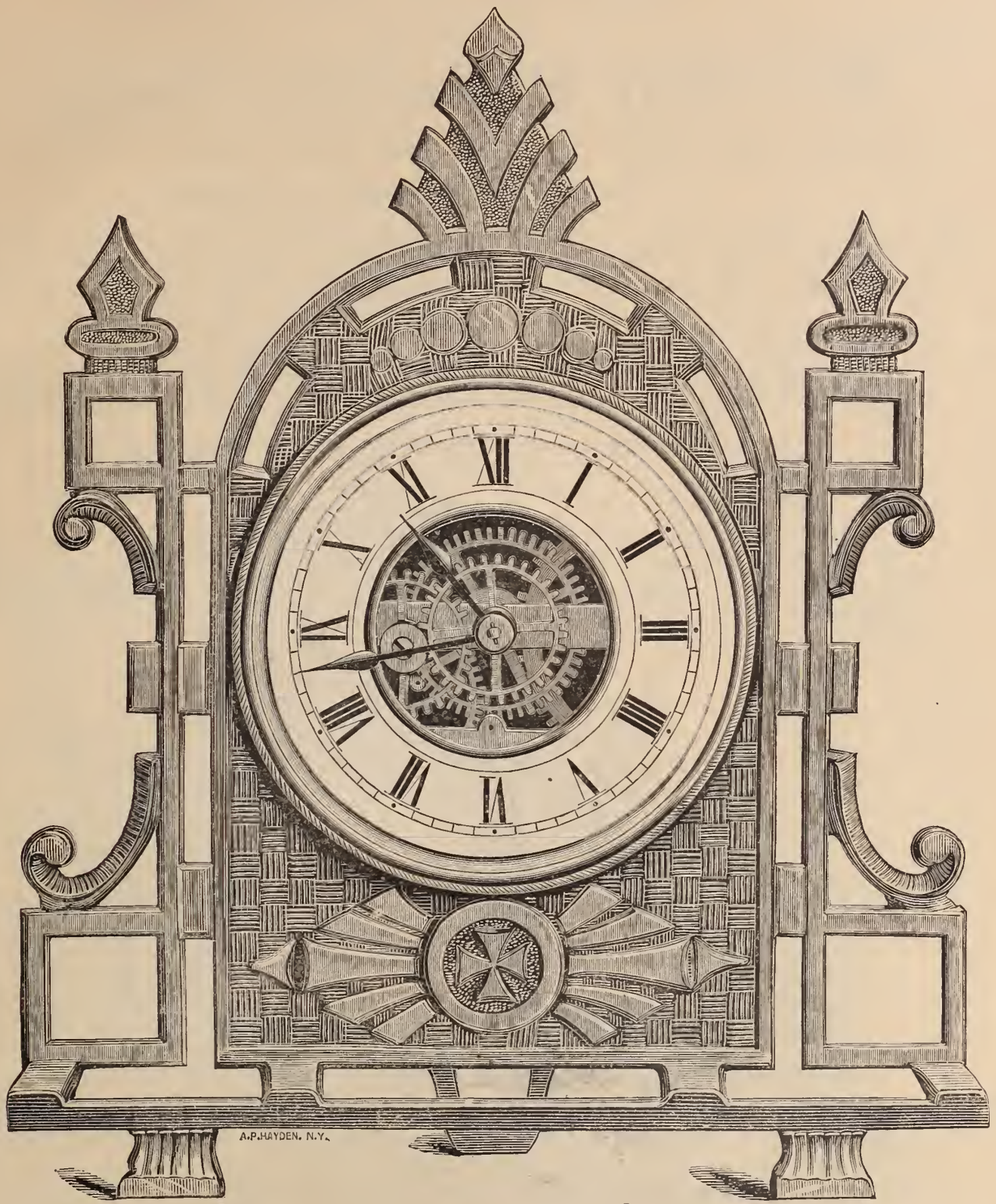
IS A

Stem Winder.

WINDS AND SETS

EVERYTHING

At the Back.



[THIS CUT IS EXACT SIZE OF THE CLOCK.]

PRICE, GILT OR NICKEL, $5.00; ALARM, $5.50.

MANUFACTURED ONLY BY

The E. N. Welch Manufacturing Co.

FORRESTVILLE, CONN., U. S. A.

GEORGE W. BROWN, Agent, 32 Warren Street, NEW YORK.

☞ *Also a full assortment of CLOCKS of the following manufactures:* **E. N. Welch Mf'g Co., Welch, Spring & Co., Atkins Clock Co., at Factory prices.**

ELECTRO-PLATED WARE.

THE

Meriden Britannia Company,

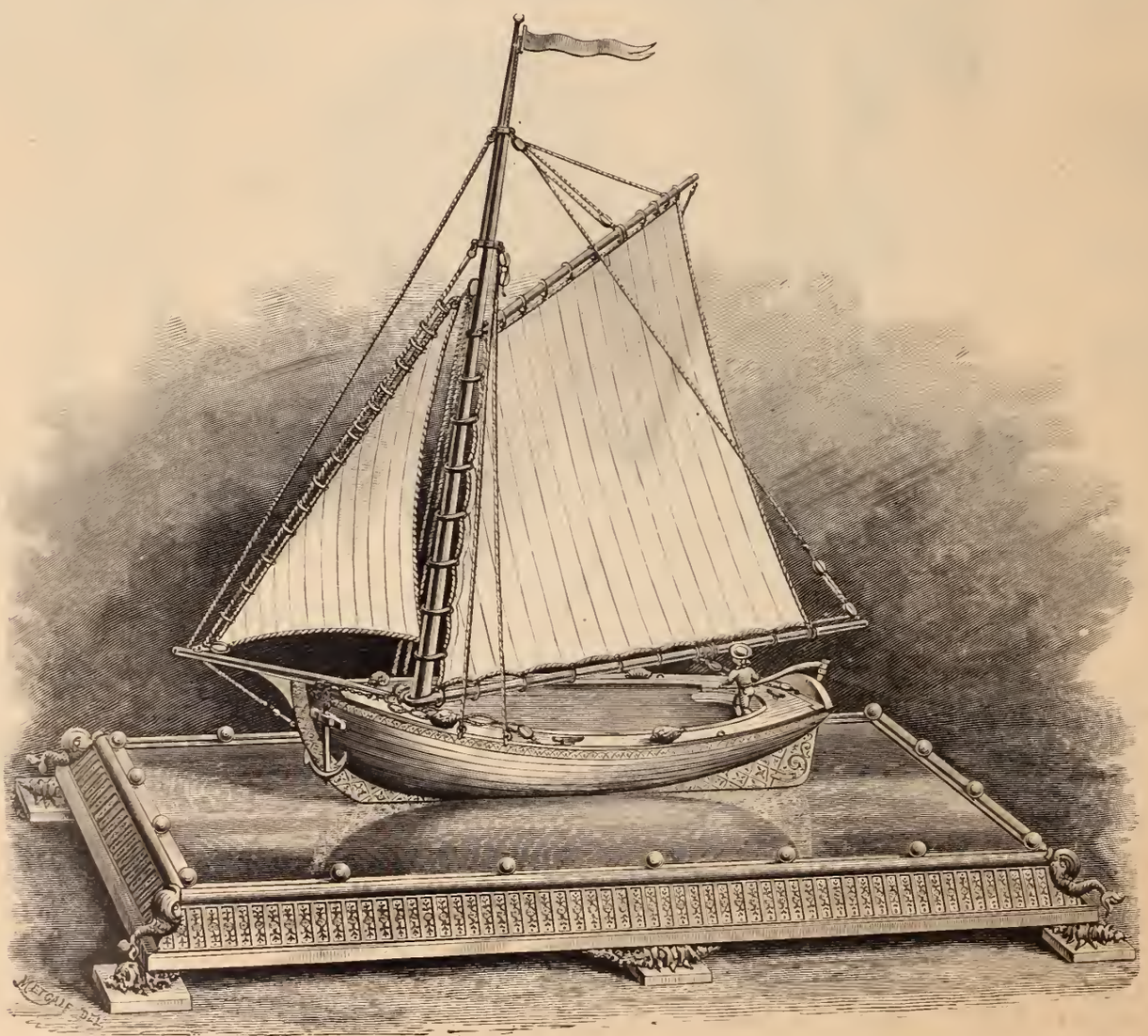
UNION SQUARE, 46 East 14th Street, NEW YORK,

Are Manufacturing and have on Exhibition

A CHOICE SELECTION OF NICKEL SILVER AND SILVER-SOLDERED PLATED TABLEWARE, COMBINING EVERY MODERN IMPROVEMENT IN PLATING AND ELEGANCE OF DESIGN, WITH STERLING QUALITY, AND OFFER THE MOST EXTENSIVE AND ATTRACTIVE ASSORTMENT OF THESE GOODS EVER PRESENTED IN THIS COUNTRY. OUR ASSORTMENT CONSISTS IN PART OF

Spoons, Forks, Table Cutlery, Dinner, Tea and Dessert Sets, Entre Dishes, Epergnes, Castors, Cake Baskets, Ice-Water Sets, Tea and Coffee Urns, Salvers, Communion Ware, &c.

Also, a large variety of Ornamental Articles suitable for Gifts.



We take much pleasure in referring to the reputation we have for many years maintained for manufacturing SPOONS and FORKS bearing the Trade Mark, "1847, ROGERS BROS."

☞Particular attention is invited to our Patented Process of Electro-Plating Spoons and Forks, by which the parts most exposed to wear received an EXTRA coat of SILVER. This feature renders these goods more economical and durable than those of any other manufacture, while the increased cost is relatively small. This method of plating we apply to the 4, 8 and 12 oz. plate, as required ☞To protect the purchaser against imitations, it should be observed that the IMPROVED SPOONS AND FORKS bear our Trade Mark, "1847, ROGERS BROS., XII."

Manufactories, West Meriden, Conn. Warerooms. UNION SQUARE, NEW YORK.

THE MIDDLETOWN PLATE COMP'Y,

Have added the following low priced goods, but of the best quality, to their large and unrivalled assortment.

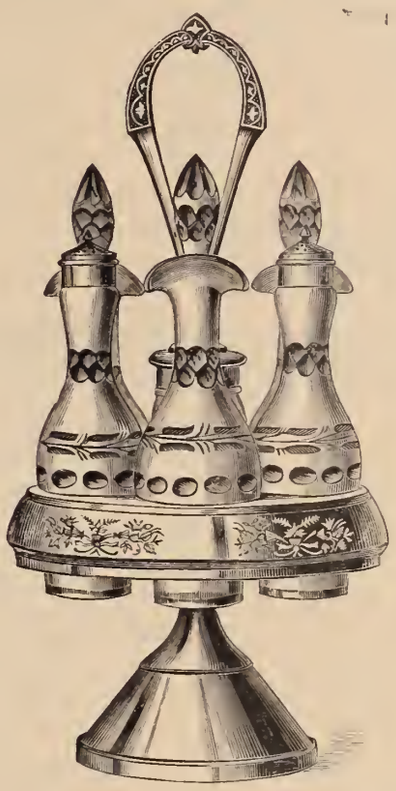
QUALITY OF ALL GUARANTEED TO BE THE BEST!

TRADE MARK.

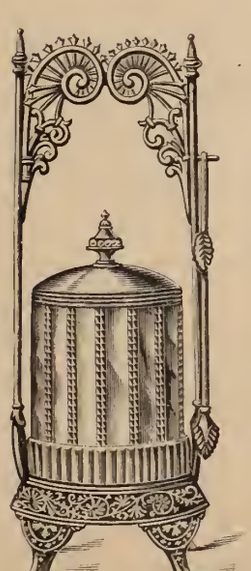




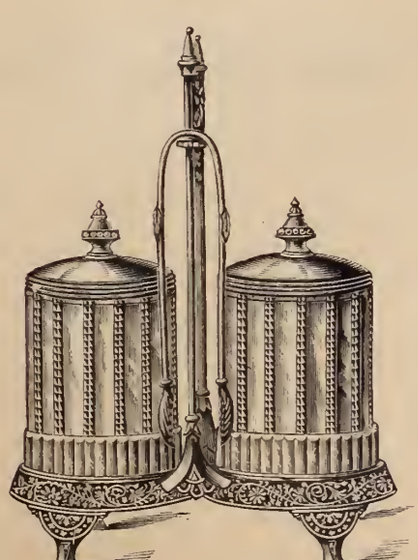
No. 1771, Basket, plain..... ....$5.00 } Gilt, extra..... ...$2.00
" " " chased,... ..... 5.50 }



No. 146, Castor, 5 bottles, plain,.. $4.75
" " " 5 " chased... 5.25
" " " 6 " plain.... 5.75
" " " 6 " chased... 6.75



No. 94, Pickle, 1 bottle, with fork, $3.00



No. 94, Pickle, 2 bottles, with fork, $5.00



No. 436, Butter, plain.....$3.50
" " " chased..... 4.00
No. 435, " cow tip, same price as above

Middletown, Conn. and 13 John St., New York.

ERNEST FRANCILLON'S

Longines Watch Factory,

ST. IMIER, SWITZERLAND.

GREAT TRIUMPH OF THE LONGINES WATCH

AT THE PARIS EXPOSITION OF 1878.

The only Gold Medal award granted for medium and low-priced Watches.

The Longines Nickel Stem-winder ahead of all competition.

The Movements and Watches of the Longines Watch Factory, so favorably known in this country, have received the highest possible recognition at the Paris Exposition of 1878, for simplicity, regularity and solidity of construction and for accurate time-keeping qualities.

☞Other Medals obtained at Paris in 1867, Vienna in 1873, Philadelphia in 1876.

THE AGASSIZ

Watches and Stem-winding Movements.

The **Agassiz Watch Factory**, *St. Imier, Switzerland, has been newly established for the production of a reliable* **Stem-winding Movement** *in the system of interchangeability of parts and regular sequence of sizes to fit cases made in advance.*

On the occasion of the first exhibit, the Watches and Stem-winding Movements received a medal of the highest grade awarded in this class at the Paris Exposition.







COLBY & JOHNSON,

Importers and Manufacturers of

Watches, Watch Cases and Jewelry

No. 17 MAIDEN LANE, New York.

We shall present to the trade, about December 1st, the following NOVELTIES in OPEN FACE Cases and Watches.

The Celluloid Watch Case, in White Celluloid, with coin silver center, pendant and bow, suitable for all 18 Size STEM-WINDING American movements.

The new Gents' Watch, **Golden Gate,** "Swiss," 20 line, stem-winding and setting movement. Case of **White Celluloid,** with coin silver center, pendant and bow.

The new Ladies' Watch, **Golden Gate,** "Swiss," 16 line, stem-winding and setting movement. Case of **White Celluloid,** with **14 carat gold center, pendant and bow.**

These cases are beautiful in design, entirely new in shape, and receive a high and delicate finish, which they always retain.

They can be inlaid with gold or silver, or ornamented in plain or color monograms, crests, or initials, with the most pleasing effect.

They are made without joints, the bezel and back being sprung on the center, and from this construction, and the nature of the material, the result is a durable, dust and water-proof case.



OTHER NEW STYLES

WILL FOLLOW IN QUICK SUCCESSION.

Correspondence respectfully solicited.





J. C. AIKIN, H. A. LAMBERT, J. B. SHEA.

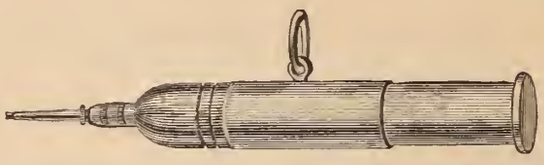
Aikin, Lambert & Co.

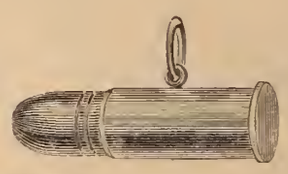


Removed to 23 Maiden Lane, New York.

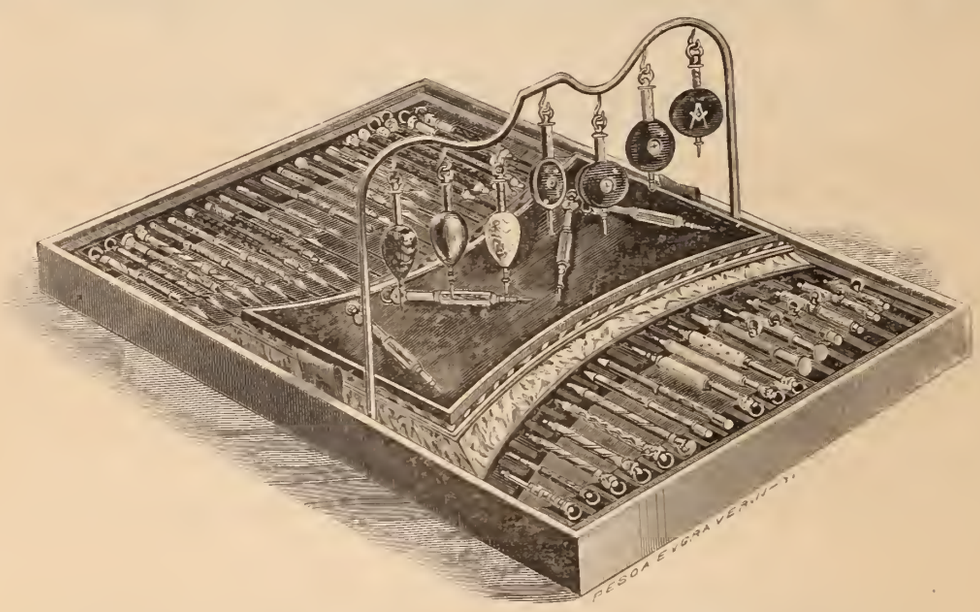
Manufacturers of Gold Pens, Pen and Pencil Cases, Pencils, Tooth Picks, and Leading "Novelties" in Pencil Goods.

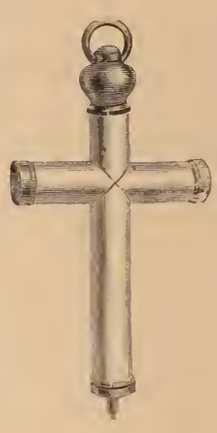












NOVELTY TRAY ASSORTMENT.





SPECIAL. ☞ Under Letters Patent we are now introducing something ENTIRELY NEW, and which we feel will meet the wants of the trade, an article that is rich, elegant and artistic in design, viz.:—The inlaying of pencil barrels in GOLD and pearl in form of vines, flowers, birds, initial letters, and other unique designs on Celluloid, in imitation of malachite, agate, varigated marble, tortoise shell, also in plain assorted colors. Also SOLID GOLD magic pencils, INLAID as above, RICH AND ELEGANT.

In connection with our leading "NOVELTIES" of last season, we show a few illustrations as above, and mention our Patented Cartridge Pencil and Watch Key, Imitation Locket (Real Stone) Magic Pencil, Imitation Locket, Intaglio and Cameo Magic Pencil, Imitation Shell Square Locket, Magic Pencil (inlaid solid gold and pearl), Imitation Shell and Malachite Magic "Ball" Pencil (inlaid solid gold and pearl), Celluloid Crystal Head Magic Pencil, gold plated, also nickel Magic "Cross," Pencil, &c., all of which are NEW TO THE TRADE, and UNEXPENSIVE, costing but a slight advance over the ordinary goods.

☞SPECIAL ATTENTION CALLED TO OUR "NOVELTY TRAY" ASSORTMENTS, which embraces all the above goods, together with a line of Tooth Picks, in plated and gold, ranging in price from fifty ($50) dollars and upwards The Tray arrangement is very tasty, being lined with silk and satin, and in keeping with the elegance of goods displayed.

LIBERAL AND SPECIAL INDUCEMENTS OFFERED. SEND FOR CIRCULAR AND NEW LIST.

J. C. AIKIN. H. A. LAMBERT. J. B. SHEA.



AIKIN, LAMBERT & Co.,

Removal to 23 MAIDEN LANE, N. Y.



MANUFACTURERS OF GOLD PENS,

Pen and Pencil Cases, Pencils, Tooth Picks,

And Leading "Novelties" in Pencil Line.





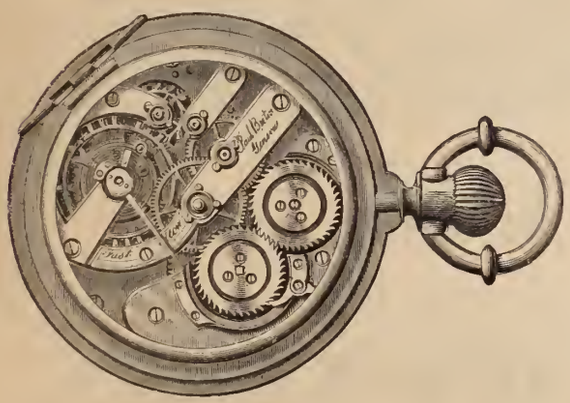
In connection with our complete line of Gold Pen and Pencil goods, we offer this season a large variety of Novelties entirely NEW to the trade, and different from any Pencil goods ever shown, all of our own patent and manufacture.

On the preceding page, we show illustrations of a portion of novelties, and invite special attention to our NOVELTY TRAY assortments, and the liberal inducements to purchasers. ☞ Send for Circular and Price List.





ALSO,



Importers of all Grades of

WATCHES.



Sole Agents for

"Paul Breton" and "Chas. Latour," Geneva.

SPECIALTIES.

AGASSIZ Movements, Gilt and Nickel, Stem-winding, fitting Ladies' Riverside Case.
CHAS. LATOUR " " " Key-winding, " 10 and 16 size Waltham Case.
PAUL BRETON " " " a full line of these CELEBRATED watches.

Metal Cased Open Face STEM-WINDING, "EXCELSIOR" and "LONGINES," 16, 18 and 20 line, the BEST metal watches, in STYLE and QUALITY, in the market. BLACK and FANCY DIALS are NOVELTIES in these watches, which are having a rapid sale.

AMERICAN WATCHES of all kinds. Gold Cases of all styles made to order. Sole Agents for EUREKA HORSE TIMER, the cheapest reliable Timer ever made, and for PNEUMATIC TIMER, which does not require the use of the hand.

We guarantee all watches sold by us, and have recently reduced our prices.

Our display of JEWELRY for the Fall Trade is complete, consisting of a general line of RELIABLE goods, both in GOLD and ROLLED PLATE, of new and tasty patterns. Special attention paid to ORDERED WORK and REPAIRS. GOODS SENT ON APPROVAL and CORRESPONDENCE invited. Those not acquainted with us will oblige by giving references when ordering.

Branch, No. 113 East Madison Street, Chicago.

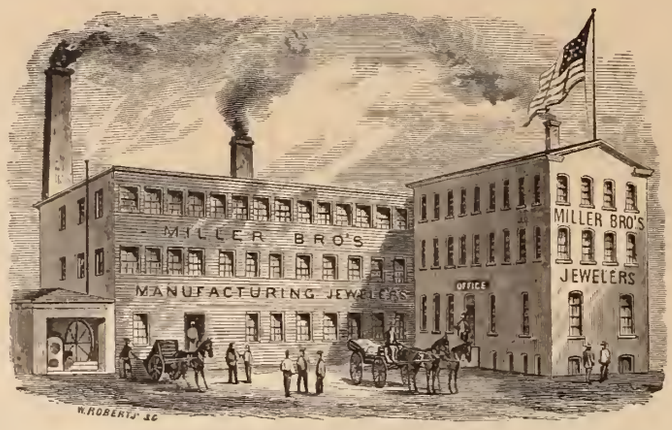
MILLER BRO'S,

MANUFACTURING JEWELERS,

No. 11 MAIDEN LANE, NEW YORK.

Manufactory, 47, 49 & 51 Franklin Street, Newark, N. J.

INITIAL GOODS A SPECIALTY!



Seals, Lockets, Sets, Sleeve Buttons, Studs, Collar and Chemise Buttons.

ATTENTION IS INVITED TO OUR

NEW STYLES OF ETRUSCAN SLEEVE BUTTONS,

MOUNTED WITH

RUSTIC LETTERS

BIRDS, ANIMAL HEADS AND FANCY ORNAMENTATIONS

C. G. ALFORD & CO.,

MANUFACTURING JEWELERS,

No. 183 Broadway, New York.

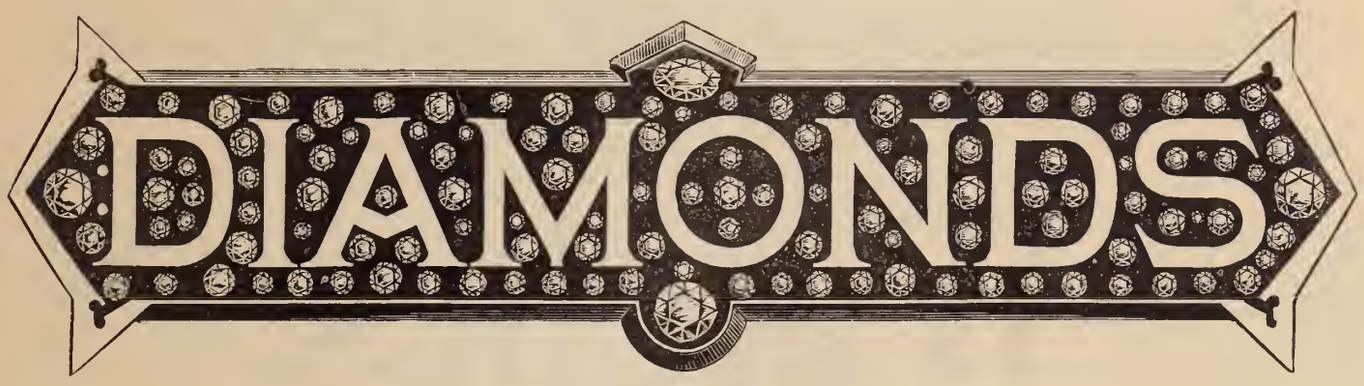
Among our Specialties, we this season offer to the Trade the most complete and attractive line of Real Novelties in FINE ROLLED PLATED CHAIN ever before introduced. The standard quality of our Chain will be fully maintained, while our prices will tempt the most scrutinizing buyer.

Dealers in search of Novelties will find it to their interest to send for our Illustrated Catalogue of Designs, which will be forwarded, on application, to the legitimate Jewelry Trade only.

Alfred H. Smith & Co.

(OF THE LATE FIRM OF SMITH, HEDGES & CO.)

IMPORTERS OF



No. 14 John Street.

NEW YORK.

☞ *Offer to the Trade recent Importations of carefully selected Goods in all qualities at close figures.*

HAMPDEN WATCH CO.

SPRINGFIELD, MASS.







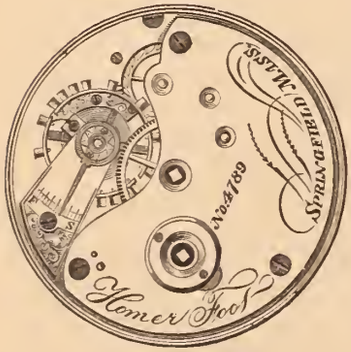
Manufacturers of KEY and KEYLESS

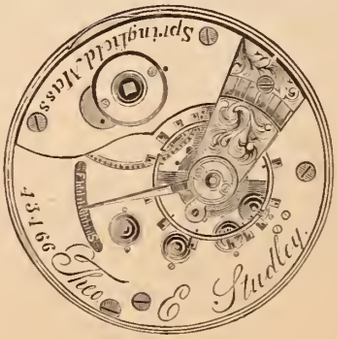


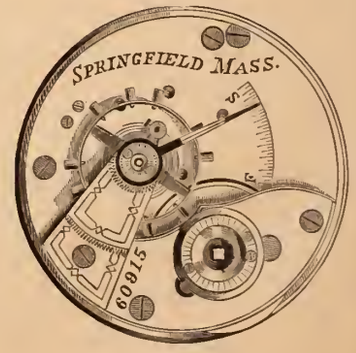
Watches.



☞The above are NICKEL, and as samples of SUPERIOR TIMEKEEPERS and for beauty of finish, we respectfully invite the SPECIAL attention of the Trade.







General Office and Factory,
Springfield, Mass.

NEW YORK OFFICE,
No. 12 MAIDEN LANE.

GORHAM M'FG. CO.

SILVERSMITHS.



SALESROOMS,
37 UNION SQUARE, N. Y.
Branch Office, 120 Sutter St., San Francisco.
Factories, Providence, R. I.

Sterling Silver Ware, $\frac{925}{1000}$ Fine.

The productions of the Gorham Co. in Solid Silver are unequalled in elegance of design and perfection of finish. Novel and pleasing effects in surface decoration by methods of treatment peculiarly our own, and not to be found elsewhere. Our stock now includes specimens after the Persian, Hindostaneé, Japanesque, Mediæval, and other desirable forms of ornamentation.

COLOR ENGRAVING.—Some of the most beautiful effects have been produced under this treatment, which was introduced into modern manufacture by us some years ago; since which time we have been improving and perfecting the process, until now we are enabled to produce almost any color or tint on surface decoration, and by so doing we can produce effects hitherto thought impossible.

BEATEN FINISH.—This was first shown in this country by us at the Centennial Exhibition in 1876, where it was much admired by connoiseurs, although at that time being in advance of the trade and public demands. We have now successfully introduced it to the trade who are having calls for this peculiar fashion. We are making many pieces, unique in form as well as in ornamentation, and especially adapted to the present feeling for Bric-a-Brac in Silver Wares. One characteristic of this finish is, that it is hardly possible that any two pieces should be exactly alike.

REPOUSSE.—We are now making some fine pieces in Repoussé of a much higher order than has hitherto been attempted; also, to meet the demands of the Trade, for a *cheaper* class of ornamented and elaborate wares, we are making a variety of small articles in Hollow Ware, of an inexpensive character, but suited to the wants of some classes of Trade.

MEDIÆVAL SILVER WARE.—We offer this style of Wares at the present time to meet the wishes of an advanced class of Trade, and our variety of these goods comprises both *hollow* and *flat* wares, and we are receiving daily additions to our stock from the latest of our Factory productions.

GORHAM PLATED WARE

Our line of Gorham Plated Ware we offer as the best possible substitute for Solid Silver being made of hard metal, silver soldered at every joint, and very heavily plated.

These goods are made entirely at our own manufactory, and the same care is taken in their manufacture and finish as in our Solid Silver, which in beauty of design, ornamentation and finish they equal.

These Wares have now been on the market for twelve years, and during this time have maintained their reputation of being the better class of Plated Ware than has ever before been manufactured in this country, and fully equal to the best of the English manufactures.

This Ware can now be sold at considerably less than former prices, while the quality will be fully up to its former standard.

SPIESS & ROSSWOG,

MANUFACTURERS OF FINE

Jewelry and Diamond Goods,

LOCKETS, CROSSES, SLEEVE BUTTONS & NECKLACES,

RICH SETS IN CORAL, ROSE, STONE CAMEO, INCRUST'ED AMETHYST AND CORAL CAMEO.

Nos. 9 & 11 Maiden Lane,

NEW YORK.

ESTABLISHED 1837.

VICTOR BISHOP & CO.

IMPORTERS OF

DIAMONDS,

PRECIOUS STONES

—AND—

CORAL JEWELRY,

No. 47 NASSAU STREET, NEW YORK

House in Paris, 66 Boulevard de Sebastopol.



TINGLEY, SINNOCK & SHERRILL,

MANUFACTURERS OF

FINE JEWELRY,

NO. 5 MAIDEN LANE, NEW YORK.

Factory, Newark, N. J.

J. B. & S. M. KNOWLES,

MANUFACTURERS OF

Sterling Silverware

Office, No. 20 MAIDEN LANE,

NEW YORK.

Factory, No. 95 PINE STREET, PROVIDENCE, R. I.

MULFORD & BONNET,

MANUFACTURING JEWELERS

—AND—

JOBBERS,

No. 21 Maiden Lane, New York.

BUCKENHAM, COLE & SAUNDERS,

SUCCESSORS TO

BUCKENHAM, COLE & HALL,

IMPORTERS OF

Diamonds, Pearls

AND OTHER PRECIOUS STONES,

MANUFACTURERS OF FINE JEWELRY,

10 Maiden Lane, New York.

☞A large stock of FINE DIAMONDS, Mounted and Unmounted kept constantly on hand. Goods sent on approval to any part of the country on receipt of satisfactory references.

E. HOWARD & CO.,

MANUFACTURERS OF

Fine Watches, Regulators, Office Clocks,

Electric Watch Clocks & Tower Clocks,

Office, No. 694 BROADWAY,

Corner Fourth Street, NEW YORK.

No. 114 TREMONT STREET, BOSTON.

J. W. J. PIERSON, - - AGENT.

KOSSUTH MARX & COMP'Y,

39 MAIDEN LANE, New York.

THE U. S. STANDARD FINGER SIZE FOR RINGS.



TIME AND TROUBLE SAVED.

Some of the advantages of which, will be found annexed and must be apparent to every Jeweler.

1st. It avoids danger of having rings stolen from tray while trying on to find one the size wanted, and also of being mislaid after taking the size.

2d. It saves time consumed in measuring ring on stick and avoids possibility of making a mistake in doing so, as the size ring is guaged in accordance with the U. S. Standard Stick.

3d. It necessitates trying but one ring on the finger, whereas a dozen had sometimes to be used before the correct size was obtained.

4th. If the salesman is hurried it is not necessary to make a memorandum of the size, as the ring will remain at the size taken, and can be laid aside until some leisure time.

5th. It can be loaned to customers whereby th y will be enabled to take the correct size, instead of using pieces of string and wire, thus making mistakes and often necessitating altering a ring two or three times.

HOW TO USE— Place the thumb of the hand, on which is the finger to be measured, against the joint on the size ring, and draw tight with the other hand

☞FOR SALE BY ALL WATCH MATERIAL DEALERS

SAXTON, SMITH & CO.

MANUFACTURERS OF

Fine Gold Chain.

No. 194 BROADWAY

New York.

Factory, No. 183 Eddy Street, Providence, R. I.

☞ **Sole Agents for the new PATENTED CHAIN BAR, containing a Detachable Pencil.**

WOOD & HUGHES,

STERLING

Silverware Manufacturers

No. 16 JOHN STREET,

NEW YORK.

HELLER & BARDEL,

MANUFACTURERS OF

DIAMOND JEWELRY,

And Dealers in Diamonds,

No. 13 John Street, New York.

☞A full line of DIAMONDS, mounted and unmounted; also, a large assortment of first-class DIAMOND MOUNTINGS of our own make always on hand. We will send goods on selection to responsible houses.

KREMENTZ & CO.,

MANUFACTURERS OF

FINE JEWELRY,

No. 13 John Street, New York.

Factory, 361 Mulberry Street, Newark, N. J.

GOODS OF OUR OWN MAKE EXCLUSIVELY.

WHITING M'F'G COMPANY,
SILVERSMITHS.

TRADE  MARK.

STERLING

WORKS & WAREROOMS,

Broadway & Fourth St., New York.

WHOLESALE ONLY.

BALDWIN, SEXTON & PETERSON

MANUFACTURERS OF

Fine Jewelry,

Diamond and Stone Cameo Goods,

GOLD CHAINS, &c.

Importers of Diamonds, Pearls, Emeralds, Rubies, &c.

WHITING BUILDING,

Cor. Broadway and Fourth Street,

NEW YORK.

CARTER, HOWKINS & SLOAN,

Makers of Fine Jewelry

Consisting of Chains, Bracelets, Sets, Pins, Studs, Sleeve Buttons, Rings, &c., in Roman, Etruscan and Enamel.

Whiting Building, Corner Broadway and Fourth Street,

A. CARTER JR.
WM. HOWKINS,
A. K. SLOAN.

NEW YORK.

C. E. HASTINGS,
GEO. R. HOWE.
W. T. CARTER.

Established 1817.

Ve. J. MAGNIN, GUÉDIN & CO.

Manufacturers and Importers,

FINE SWISS WATCHES.
REPEATERS, CHRONOGRAPHS & CALENDARS.
GENEVA GOLD JEWELRY,
FRENCH CLOCKS AND BRONZES,
RICH FANCY GOODS,
HORSE-TIMERS & PODOMETERS,
GOLD AND SILVER CHATELAINE WATCHES.

No. 652 BROADWAY, NEW YORK.

Sole Agents for the James Nardin Watch.
House in Geneva, 14 Grand Quai.

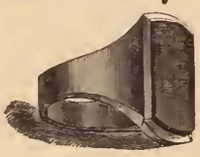
HALE & MULFORD,

MANUFACTURERS OF

RICH JEWELRY,

☞ First-class Goods of our own make exclusively.





Special attention is called to our Patent STONE BACK SEAL RINGS.

☞ *Send for illustrated circular.*

No. 694 Broadway, cor. 4th Street, New York.
(WHITING BUILDING).

Established 1873.

THOMAS G. BROWN,

MANUFACTURER OF

FINE JEWELRY,

NEWARK, N. J.

—AND—

9 BOND STREET, NEW YORK.



OFFICE OF

THE ADAMS & SHAW COMPANY

SILVERSMITHS

694 BROADWAY, NEW YORK





TO THE TRADE.

We beg the favor of your attention to a few facts which we think may be of interest to our friends in the trade, and especially to the large number who have so satisfactorily handled our goods during the past year.

We have greatly enlarged our variety and stock of **Small Silver for Wedding and Holiday Gifts**, and it is conceded that a cleaner stock of desirable goods at satisfactory prices cannot be found in the city.

We call your especial attention to our patterns of **Spoons and Forks**, which are regarded as the most successful in the market.

We are prepared to furnish designs and estimates for Testimonials, both public and private, Military and Long Range Rifle Matches, Race Cups, etc., etc., upon application.

ELECTRO PLATE

We also make the very finest **Hard Metal, Silver-Soldered Plated Ware**, and were the first to discard entirely the use of soft solder in soldering the joints, mounts, etc., and no such weak spot or defect can be found in any piece of ware ever made by us.

We are always happy to answer enquiries relating to our business, and will be pleased if you will favor us with a call when you are in the city.

Very respectfully yours,

THE ADAMS & SHAW COMPANY.

OFFICE OF

ALFRED H. SMITH & CO.,

Of the late Firm of SMITH, HEDGES & CO.,

IMPORTERS OF DIAMONDS,

No. 14 JOHN STREET, NEW YORK.

In offering to you our RECENT HEAVY IMPORTATIONS of carefully selected Goods, we respectfully call your attention to a few facts bearing upon our ability to fill your orders, to your positive advantage.

We give to this business our EXCLUSIVE ATTENTION, admitting to our stock NO OTHER merchandise whatsoever.

We are DIRECT Importers of DIAMONDS so that, with us, Dealers will find ORIGINAL parcles to select from.

Our Foreign purchases are made by ourselves in person, thus insuring Goods best adapted to the requirements of the Trade, and at the lowest possible figures.

Any Goods you may be pleased to order from us, either for your stock, or on Memorandum, will be forwarded by us, without VALUE expressed thereon, and may be returned in like manner, (we assuming risk) thereby saving you the heretofore burdensome charges.

Exceptionably choice SINGLE STONES and FINELY MATCHED PAIRS will always be found with us, as well as a fine line of MOUNTED GOODS.

Yours, very respectfully,

ALFRED H. SMITH & CO.

New York, November 15th, 1878.

Wm. S. Hedges & Co.,

Of the late firm of SMITH, HEDGES & CO.

IMPORTERS OF

DIAMONDS,

No. 170 Broadway, cor. Maiden Lane,

NEW YORK.

Choice Brilliants in single stones and matched pairs a specialty.

J. B. BOWDEN & CO.

MANUFACTURERS OF

SOLID GOLD & STONE RINGS

A LARGE ASSORTMENT ALWAYS ON HAND.

Old No. 11 Maiden Lane, New York.

ONYX GOODS A SPECIALTY!

JOHN A. RILEY & CO.,

Manufacturing Jewelers,

ETRUSCAN GOLD AND CORAL SETS, ROMAN BRACELETS NECKLACES, &C.

Nos. 7 and 9 BOND STREET

NEW YORK.

No. 126 Kearny Street, San Francisco, Cal.

WHEELER, PARSONS & HAYES,

MANUFACTURERS OF

Watch Cases, Gold Chains & Fine Jewelry,

AND DEALERS IN

AMERICAN AND SWISS WATCHES,

NO. 2 MAIDEN LANE, NEW YORK.

MOORE & HORTON,

JEWELERS,

No. 11 Maiden Lane, New York.

SPECIALTIES!

Stone Cameo, Onyx, Amethyst, Topaz and Pearl Rings. Studs, Collar and Sleeve Buttons.

☞Also our new fac-simile of Fine African Diamonds, mounted in Rings, Studs, Pins, Ear-rings, Scarf Pins, Medallions.

W. H. SHEAFER & CO.,

Makers of Fine Jewelry

CONSISTING OF

BRACELETS, SETTS, LOCKETS, PINS,

STUDS, SLEEVE BUTTONS, RINGS, &c.

SPECIALTY:—STIFFENED ROMAN BANDS.

No. 908 Chestnut Street, PHILADELPHIA.

E. Bissinger,

Manufacturer of Jewelry,

And Importer of Diamonds,

192 Broadway,

New York.

ALLING BROS. & CO.

MANUFACTURERS OF

FINE JEWELRY,

Full Line of Roman and Mosaic Goods,

Earrings, Buttons, Studs and Rings.

SPECIALTIES:

ENGRAVED AND ENAMELED BANDS,

CAMEO GOODS.

170 BROADWAY, NEW YORK.

DYER BRAINERD. JOHN W. STEELE.

BRAINERD & STEELE,

MANUFACTURERS OF



Brainerd's Pat. Lockets,



(Patented June 17, 1874.)

These Lockets combine both beauty and strength. They are made of solid 14kt. gold, and the stones used are the finest obtainable in the market. They cost no more than those of the old style, if indeed as much; and the combination of secrecy and durability renders them much more desirable. We make three sizes in four different shapes—round, oval, cushion and oblong square; and also Sleeve Buttons of the same style, containing a concealed box for miniatures, a novelty new to the Trade.

FINE GOLD JEWELRY,

No. 9 Maiden Lane,

NEW YORK.

CHATTERTON & DODD,

Makers of Fine Jewelry

Consisting of Sets, Pins, Ear-Rings, Lockets, Crosses, Sleeve Buttons, Studs, &c.

No. 19 John Street, New York.

ROMAN, ETRUSCAN AND ENAMEL WORK GENERALLY, SPECIALLY DESIGNED BY US.

Platinum Tipped Diamond Settings,

Patented April 16th, 1878, by

Ripley, Howland & Co.





Office, No. 35 Maiden Lane, New York.

Factory, 383 Washington Street, Boston, Mass.

T. GRANBERY,



Manufacturer of

BLACK ONYX



GOODS.

Patented July 16th, 1878.

This Locket is made with double glasses, in numerous shapes and sizes, shows less gold, and is lower priced than any other onyx locket manufactured.

☞ Is especially designed for Ladies' and Gents' Mourning Wear.

☞ **Coral Repairing for the Trade.**

51 Nassau Street, New York.

ENOS RICHARDSON & CO.

MANUFACTURERS OF

FINE GOLD JEWELRY,

Gold Chains, Lockets, Crosses and Necklaces,

COLORED AND ETRUSCAN WORK.

All Goods sold strictly of our own manufacture.

23 MAIDEN LANE, NEW YORK.

ENOS RICHARDSON, L. P. BROWN, F. H. RICHARDSON,
THOS. SLATER, W. P. MELCHER.

Established 1834.

G. & S. OWEN & CO.,

Makers of Fine GOLD JEWELRY

SPECIALTIES:

Black Onyx Goods,

Hair Chain Mountings,

Hooks and Bars.



The only makers of Box and Glass Goods, consisting of Pins, Ear-Rings, Sleeve Buttons and Lockets for pictures or devices in hair.

☞All our goods exclusively of our own manufacture.

5 MAIDEN LANE, NEW YORK.

CHATELLIER & SPENCE,

Manufacturing Jewelers,

652 BROADWAY, NEW YORK.

No. 1129 Chestnut Street, PHILADELPHIA, PA.

No. 12 West Street, BOSTON, MASS.

No. 120 Sutter Street, SAN FRANCISCO, CAL.

SHOEMAKER & CO.,

MANUFACTURERS OF

Onyx, Cameo and Intaglio Buttons,

AND LOCKETS.

☞**A full line of Roman Goods, including Bracelets.**

No. 21 Maiden Lane, New York.

ESTABLISHED 1859.

RINGS A SPECIALTY.

BRYANT & BENTLEY,

No. 12 Maiden Lane, New York.

MANUFACTURE A LARGE VARIETY OF

FINE SOLID RINGS,

For Ladies and Gentlemen, in CAMEO, AMETHYST, ONYX, TOPAZ, TURQUOISE, GARNET and other stones, Fine CAMEO, CORAL and ROMAN SETS of new and handsome designs. LOCKETS, MEDALLIONS, SHAWL and SCARF PINS, SLEEVE BUTTONS, STUDS, &c. All goods warranted.

☞We continue to manufacture several hundred patterns of **HARD SOLDER RINGS**, in every style, for men, women and children, stamped and warranted 16 carat fine.

COE, PINNEO & STEVENS,

MANUFACTURERS OF

LOCKETS,

WHITE ENAMEL STUDS & BUTTONS,

Linen Finished and

FINE JEWELRY,

Old No. 9 Maiden Lane, New York.

CARROW, CROTHERS & CO.,

MANUFACTURERS OF

FINE JEWELRY,

No. 12 John Street, New York.

Specialties!

FINE LINKED SLEEVE BUTTONS, ROMAN BAND BRACELETS, LOCKETS & CROSSES.

N. B.—We desire to call the attention of the Trade to our IMPROVED BRACELET CATCH, and our new styles of Link Sleeve Buttons.

Established 1846.

WILLIAM RIKER,

No. 5 Maiden Lane, New York.

Factory, 42 Court Street, Newark N. J.

NOAH MITCHELL,

MANUFACTURER OF

Fine Gold Jewelry

CAMEO SETS, ONYX GOODS,

Medallions, Studs, Sleeve Buttons, Rings and Diamond Settings of all Kinds.

DIAMOND SETTING A SPECIALTY.

694 & 696 Broadway, cor 4th St., New York

(WHITING SILVER MF'G CO.'S BUILDING.)

ALL ORDERS PROMPTLY ATTENDED TO.

GEO. W. PRATT. IRA GODDARD.

GEO. W. PRATT & CO.

Manufacturers and Dealers in

American and Swiss Watches

SOLID BAND AND SEAL RINGS.

Gold and Roll-Plated Jewelry.

No. 14 JOHN STREET, NEW YORK.



Nº 24 DOELEN STRAAT AMSTERDAM, HOLLAND.
Nº 1 GAERTNER PLATZ MUNICH, GERMANY.

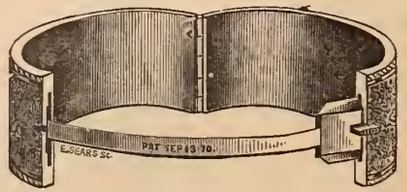
☞ *Diamonds loose and mounted sent on approval on receipt of satisfactory reference.*

Established 1845.

WILLIAM H. BALL,

SUCCESSOR TO

BALL & BARNARD,



MANUFACTURER OF

Roman, Enameled and Engraved

BANDS.

Having given the manufacture of Band Bracelets my entire attention for a number of years, it has been my desire to make a durable article, one that will give satisfaction to the seller as well as the wearer. I desire to call the attention of the trade to the reduction I have just made in prices, still keeping up the standard as to quality, finish and workmanship. To each pair of BANDS I attach my patent guard without extra charge—thus saving the price of chain—which for seven years past has given entire satisfaction.

No. 9 JOHN STREET, NEW YORK.

Factory, 30 & 32 Franklin Street, Newark, N. J.

J. A. BROWN & CO.

OFFICE AND SALEROOM: No. 11 Maiden Lane, N. Y.
FACTORY: No. 104 Eddy St., Providence. R. I.

SOLE MANUFACTURERS OF THE

Ladd Patent Stiffened Gold Watch Cases



For the Movements of the various American Watch Co.'s Gent's, Ladies' and Boys' sizes, Key and Stem-Winders, and in the following styles, BASCINE, FLAT-BEVEL and MANSARD, (this latter as originally named, modeled and introduced by them) forming the most complete and varied line of elegant Cases ever offered for sale. It is now eleven years since these Watch Cases were introduced to the public, during which period of time they have steadily gained in popular confidence and esteem, as is evinced by the unprecedented fact in the history of the Watch Trade that more than FIFTY THOUSAND of them have been manufactured and sold. Made of thick plates of Gold and Nickel Composition, (this Composition is harder and tougher than any other metal except the gold itself, and suggested the term STIFFENED, originally used by us to designate this important improvement; no other case in the world is made like it;) thoroughly welded together and rolled to the required thickness—they are, while equally handsome—stronger and more durable than the finest Solid Gold Cases of the same thickness of metal, and at ONE-THIRD or ONE-HALF the COST, and with good movements, they make the cheapest, most elegant and serviceable Watches in the market. The critical examination of these good by the trade and public is invited. **FOR SALE BY JEWELERS GENERALLY**

☞Dealers can obtain them of the Wholesale Watch and Jewelry Houses, or their Traveling Agents, throughout the United States and British Provinces.

☞All genuine Watch Cases of our manufacture, have "G. W. Ladd's Patent, June 11th, 1867," stamped upon the side band underneath the glass bezel.

Refuse all others. Send for full Descriptive Circular.

NATHAN E. MORGAN. CHAS. B. HEADLY.

MORGAN & HEADLY,



☞We have added to the manufacture of Gold Spectacles and Eye-Glasses those of STEEL, and are able to fill all orders with promptness. Illustrated Catalogues sent on application.

☞A full line of *DIAMONDS*, mounted and unmounted, always on hand which we will send on approval to the Trade, on receipt of reference.

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611 & 613 Sansom Street, Philadelphia.

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LOUIS A. SCHERR & CO.

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Watches, Jewelry,

WATCH MATERIALS, TOOLS, GLASSES, &C.

Spectacles, Silk Guards, &c.

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ESTABLISHED 1855.

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Repairing neatly attended to.

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Pattern Books containing 300 design of the most current articles will be sent on receipt of 50 cents, which amount will be returned with the first order.

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Patentee and Sole Manufacturer of the Patent Revolving Rings, the design of which will be found in other pattern books. A complete stock of 14kt.

Solid Jewelry, as Sone Rings, Lockets, Studs, Buttons, etc., constantly on hand, from which I will send for selection to responsible parties.

JOBBING OF EVERY DESCRIPTION.



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ACH. SQUADRILLI,

MANUFACTURER & IMPORTER OF

Coral, Conch Shell, Silver Filigree, &c.

F. De FILIPPO, Manager,

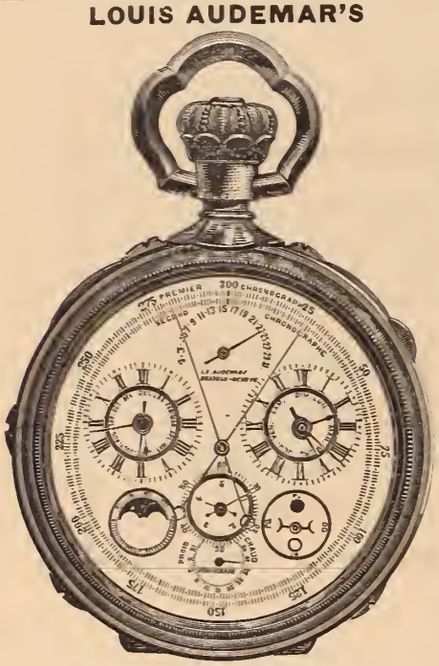
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Manufactory, 7 Strada della Pace, Naples, Italy.

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☞Special department for the MANUFACTURING, REPAIRING and REPOLISHING of Coral, Filigree Jewelry, &c., for the Trade.

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SOLE AGENT,

J. Eugene Robert,

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☞Swiss Watch Movements of all sizes! In gold cases from ten lines up; in silver cases from thirteen lines up.

BOREL & COURVOISIER TO THE FRONT!

SWISS WATCHES

AGAIN RANK AS THE BEST.

IMPROVED MACHINERY HAS DONE THE WORK.

☞We are happy to inform our agents and patrons that the **new B. & C.** are now ready. ALL ORDERS CAN BE FILLED AT ONCE! We are authorized to make a considerable reduction from former prices, in order to place them within the reach of all.

☞**Dealers wishing to act as authorized agents for the sale of these celebrated Watches and Movements will be furnished with full particulars by addressing, with business card,**

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A CARD.—After the recent great Improvements to my Cases, I confidently offer them to the Trade, as being without a superior in the market, and so acknowledged by some of the best houses.

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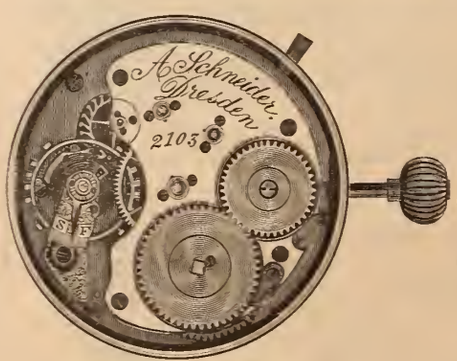
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Medal and Diploma of Merit
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For Jewelry, Silver Ware, Trays, &c.

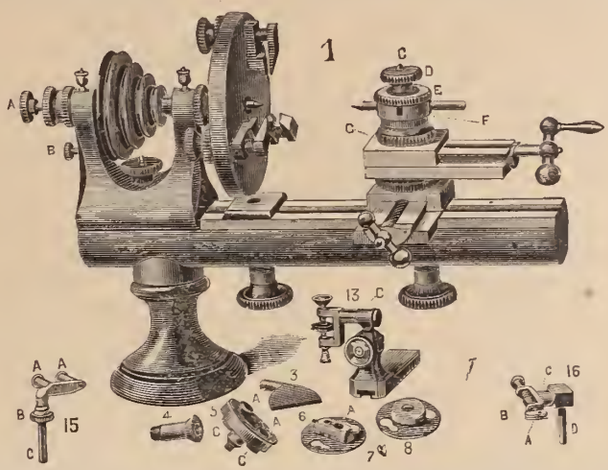
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HOPKINS' WATCH TOOL CO.



Manufacturers of **HOPKINS' PATENT WATCHMAKERS' TOOLS**, embracing Plain and Combination Lathes, Chucks, Slide and Swing Rests, Gear Cutters, Pivot Polishers, Jeweling and Staking Tools, &c.
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ANTIQUE CANDLESTICKS,
SCONCES, CARD TABLES, &C.

WHICH WE ARE OFFERING THIS FALL AT GREATLY REDUCED PRICES.

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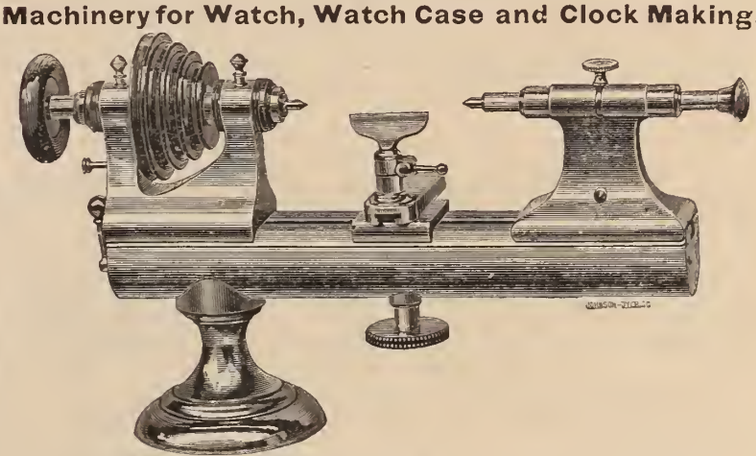
67 Greene Street,
68, 70 & 72 Wooster Street,

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MANUFACTURERS OF THE WHITCOMB LATHE,
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☞ Please send your orders.



GUTMANN'S
AUTOMATIC
Hammer and Punches.

Simplified and more Effective.

Patented January 8th, 1878.

This Tool takes the place of the third hand, therefore its manifold uses are quickly apparent, and I would only say, that it is accompanied by six punches, to-wit: 1 prick punch, 2 hand punches, 1 closing hole punch, 1 rivet punch, 1 pinion punch, all of which fit neatly into the punch holder, and are fastened by the set screw. Its tap is alternately heavy and light, and the finger loops are assorted in sizes The Tool is nickel-plated and boxed, ready to be mailed.

THE OPERATION IS AS FOLLOWS First, set the hammer; next insert your forefinger through the loop at the top and place the punch with firmness on your work. When you are ready for the blow, push gently on the thumpiece, which produces the concussion on the punch. Your left hand is entirely free to hold the work.

Price, $2.50 Each.

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BLACK ONYX GOODS,

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Having my own cutting and polishing establishment at Nos. 23 and 25 Looijersgracht, Amsterdam, Holland, constantly running 36 mills, I am able to offer to the trade a full assortment of Diamonds at very low prices.

Loose and Mounted Goods sent on approval to any part of the country on receipt of satisfactory references.

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BOOZ & THOMAS,

MANUFACTURERS OF

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Watch Cases & Jewelry,

108 SOUTH EIGHTH STREET,

Second Story, **PHILADELPHIA.**

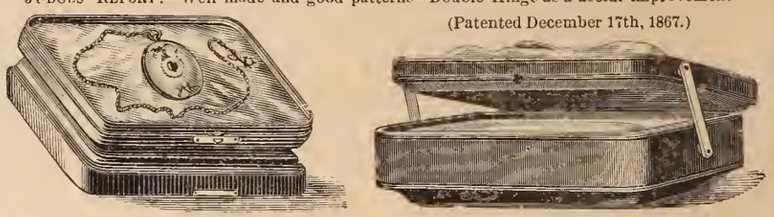
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PARTICULAR ATTENTION PAID TO REPAIRING.

ESTABLISHED 1854. ☞Medal and Diploma Awarded at Centennial Exhibition.
JUDGES' REPORT:—Well made and good patterns—Double Hinge as a useful improvement

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Morocco, Velvet and Cabinet Cases,

FOR JEWELRY, WATCHES & SILVERWARE.

TRAYS FOR SHOW CASES, TRUNKS, &C.

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(UP STAIRS),

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Respectfully announces to the Trade that he still continues the business of *ELECTRO-PLATING* in Gold, Silver and Nickel. His improved process of Electro-plating enables him to deposit a greater thickness of gold, etc., on the article to be plated than by the old process. In proof thereof he refers to any of the large jewelry jobbing houses in this city.

☞Orders promptly attended to, and prices at lowest rates.

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Manufacturing Jewelers,

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P. O. Box 4144. NEW YORK.

H. Muhr's Sons, Philadelphia.

MANUFACTURING JEWELERS,

Solid Gold Finger Rings of Every Description.



Crown, 18k. Lion.



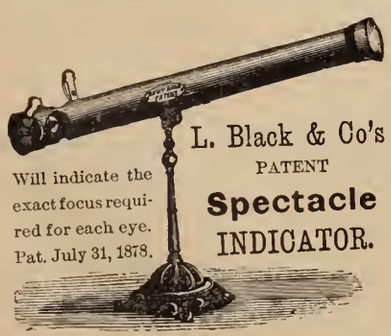
On and after January 1st, 1876, our make of Filled Plain Rings will be stamped as above, which stamp is copy righted. Any and every infringement on the above Trade Mark will be dealt with according to law. ☞Every one warranted.

THESE GOODS ARE SOLD BY ALL THE LEADING JOBBERS!

Should the house that any retailer deals with not have them we will furnish them with the address of the nearest Jobber. ☞SELL TO THE JOBBING TRADE ONLY!

New York Office, 11 Maiden Lane.

☞Address all communications to Philadelphia.



Will indicate the exact focus required for each eye. Pat. July 31, 1878.

L. Black & Co's PATENT **Spectacle** INDICATOR.

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We are exclusive manufacturers of a large variety of Spectacles and Eye Glasses, in steel, silver and gold frames. Special attention is directed to our frameless, double vision and interchangeable Spectacles and Eye Glasses. For particulars and price-lists address the above-named firm.

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Watches, Watch Materials,

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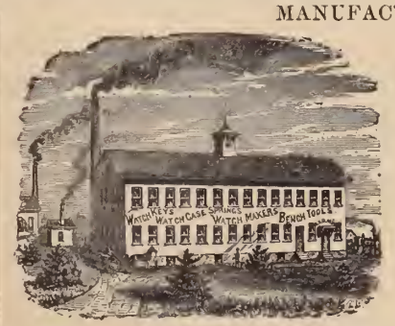
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Country orders solicited. Watch repairing and jewelry jobbing done on the premises, in the best manner, and at reasonable prices.

☞All orders promptly attended to.

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WATCH KEYS,

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Watchmakers' & Jewelers'

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Crosby's Jeweling Tools, &c.

Sold by Jobbers in Watch Materials and Notions.

☞**Small Articles in Metal Manufactured to order.**

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☞Show Case Trays in Black Walnut and Rosewood.

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THE PORPOISE.

☞This Oil is made from the best of stock, is free from gum or corrosion, will stand the coldest weather, and is every way reliable.

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KOCH & CO., Elberfield, Prussia, SOLE AGENTS IN EUROPE.

ROSKOPF WATCH.

J. D. HUGUENIN & CO.,

GENERAL AGENTS,

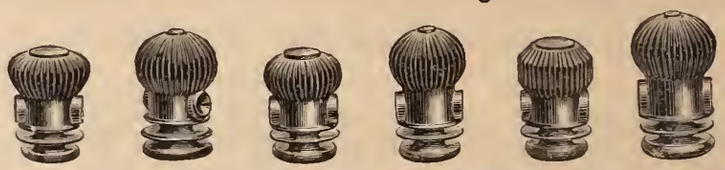
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The reputation of this Watch as an accurate timekeeper is fully established, and during the ten years that it has been before the Trade, has won an abiding reputation for fine Time-keeping qualities, and the BEST WATCH for the money in the world.

☞Send business card for price list.

MILNE & JOURDAIN,

Manufacturers of Stem-Winding Watch Crowns



13 & 15 Franklin Street, NEWARK, N. J.

Gold Crowns, for Stem-winding Movements, to suit all sizes of Imported or American Watches, in four different styles and seven sizes.

Gold Pushers for Key Movements in every size. Also Gold Crowns for fine Chronograph Watches made to order.

☞Silver Stem winding Crowns and Key Pushers on hand or made to order. Send for card and samples.

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JOBBER OF AMERICAN MOVEMENTS,

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ALSO, ORNAMENTAL ENGRAVER AND ENGINE TURNER.

Lubricating Oils, for Watch, Clock and Chronometer Makers.

The discovery of a Lubricator for FINE MACHINERY, such as Watches, Clocks and Chronometers, that is free from gum and corrosive substances, has taxed the ingenuity of hundreds of men whose efforts have proved a failure. But we are happy to say (being largely interested) that such an article has been supplied by MR. EZRA KELLEY, of New Bedford, Mass., who, after forty years study of the subject, has perfected a Lubricator that recomends itself to all who have used the *genuine*, (there having been numerous counterfeits in the market,) as witness also the award of a Diploma and Medal by the judges of the late Centennial Exhibition at Philadelphia. We have no hesitation in saying that his Oils are the BEST manufactured, always uniform in quality and capable of standing all tests applied to lubricating oils. We cheerfully recommend it to all who may in their business require a FIRST-CLASS LUBRICATOR.







AMERICAN CLOCK CO., (Hine & Thomas.)

P. S.—The above Oils can be procured at all first-class wholesale Watch and Clock Establishments in the Unit d States, as well as his only Agents, GRIMSHAW & BAXTER, 35 Goswell Street, London England.

New Bedford, October 15, 1877.

Dorrance, Edge & Co.

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THE CELEBRATED WOVEN FABRIC

GOLD CHAIN.

Elegantly Mounted Bracelets, Opera, Leontine,

VICTORIA WATCH GUARDS & NECKLACES, in all the Newest Designs.

☞Our stock is unusually complete, and, in addition to the above, a variety of Necklaces, from 1½ to 40 dwt. each, to which we invite the attention of buyers.

No. 9 John Street, New York.

Factory, 46 Greene Street, Newark, N.J.

Mathez Watch Company of New York.

Gents' and Ladies' Stem-Winding Movements

STRAIGHT LINE, 3-4 PLATE NICKEL.

These Movements are of six different grades, uniform in size and beautifully finished, and will be SOLD AT LOWER PRICES than any other goods of similar exeellence.

☞A FULL LINE of materials for our movements always kept in stock for the convenienee of those using our goods.

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JULIEN GALLET,

Importer of Watches,

From his own Factory, Chaux de Fonds, Switzerland.

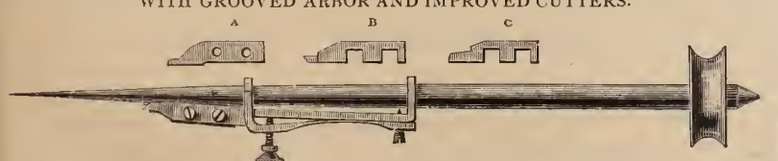
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Leon L. Gallet,
Charles Perret,
Jules Racine.

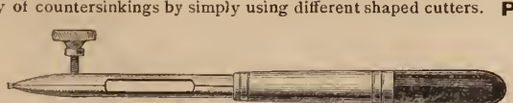
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Schwerter's Patent Adjustable Jewel Setting and Counter Sinking Drill.

WITH GROOVED ARBOR AND IMPROVED CUTTERS.



This tool will enable any watchmaker of ordinary skill to do a good jeweling job, and in some cases in less time than it could be done with a lathe. The tool can also be used to make a variety of countersinkings by simply using different shaped cutters. **Price $6.**



This cut represents Schwerter's Patent Jewel Setting Opener, a very handy tool, which will in almost every instance open a closed jewel bezel without injuring it. ☞PRICE $1.25. On receipt of price these tools will be promptly forwarded to any address.

Address AUG. SCHWERTER, 51 Canal Street, N. Y.

☞A liberal discount will be made to dealers on orders of not less than ½ doz.



DEMMERT BROTHERS,

Manufacturing Jewelers,

STONE, CAMEO GOODS,

Colored and Etruscan Work

A SPECIALTY.



Old No. 9 Maiden Lane, New York.

Factory, 123 Railroad Avenue, Jersey City.

JOSEPH DEMMERT. FERDINAND DEMMERT.

HENRY HIRSH. EDWARD HIRSH.

HIRSH BROTHERS,

Dealers in Watches & Diamonds

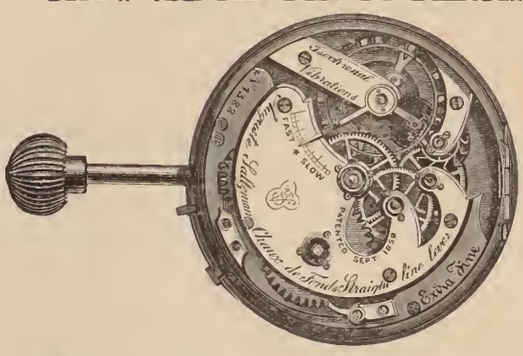
AND MANUFACTURERS OF

JEWELRY,

No. 23 Maiden Lane, New York.

☞ Prompt attention given to filling orders for all kinds of goods pertaining to the trade.

A. SALTZMAN,



Manufacturer and Importer of

Fine Swiss Watches.

Sole Importers of the

AUGUSTE SALTZMAN,
ALBERT VUILLE,

WATCHES.

☞SPECIAL NOTICE.—The Trade is respectfully notified TO BEWARE of imitations of the name of SALTZMAN, marked on Watches of an inferior grade, and purporting to be the genuine Saltzman.

No. 15 Maiden Lane, New York.

T. B. BYNNER,

Importer & Jobber of Watches

DIAMONDS AND FINE JEWELRY,

And Dealer in the BEST CLASS OF ROLLED PLATE JEWELRY

And Key and Stem-Winding American Watches.

No. 513 Broadway, New York

STERLING SILVER WATCH CASES.

HAVE WE A STANDARD FOR SILVER IN THIS COUNTRY?

WHEN WARES ARE REPRESENTED TO BE "SILVER," WHAT IS MEANT?

A Fixed and Universal Standard for Silver Wares Necessary.

It must be a High One to obtain Public Confidence!

The "Sterling" Standard Meets all Requirements.

It is Adopted by the American Watch Company

FOR SILVER WATCH CASES.

☞ STERLING SILVER WATCH CASES SOLD AS CHEAP AS THE DEBASED CASES OF OTHER MAKERS.

REDUCTION IN PRICES.

IT is but a few years since silver table ware was made of various qualities, from that of Sterling silver down to that base metal which the country spoon-maker said "was alloyed only one per cent."—one copper penny to a silver dollar. The results of this lack of a standard for the manufacture of silverware were the general debasement of the quality of the work, the discredit of the dealers, and an utter loss of confidence by the purchaser in the goods offered to him. The leading manufacturers of these goods, appreciating the necessity of winning back the confidence of the public, determined to redeem the reputation of silver table ware, and accordingly resolved to raise their standard to Sterling, and to keep it there. As they took pains to let the public know that there could be no swindle in the quality of the silver of which their goods were made, there was at once a demand for Sterling silver ware, and all manufacturers who did not follow their lead lost their trade and were heard of no more forever.

Now, we ask the dealers in watches if it is not just as imperative that there should be a high and fixed standard of silver in Watch Cases as in table ware? In fact, are there not many reasons why it is more important that Watch Cases should be of fine quality? Until recently the Silver Watch Case trade has been in exactly the same demoralized condition as was formerly the table ware trade described above. The highest quality recognized in silver cases was denominated "coin," meaning that it was of the standard value of United States coin, but without defining what particular "coin" was recognized as the standard. It might mean the three cent piece standard of coin, or the "dollar of our daddies." From the so-called coin standard, the quality of silver in watch cases ran down to the "one per cent. alloy," as defined by the country spoon-maker.

The consequence of this debasing of the quality of silver used in watch cases was that the public, having no guide to go by, and conscious of being swindled by unscrupulous dealers, lost confidence in all, and the trade necessarily became fearfully demoralized. This distrust of cases which the public entertained extended beyond the trade in cases, and seriously affected the business of the movement makers. People are apt to judge by outside appearances. When one finds flies in the crust of his pie, he is pretty sure to look with suspicion upon the "huckleberries" within. So the public, knowing they were being swindled in the quality of watch cases offered them by the trade, were suspicious that the movements contained in the deceptive cases were equally untrustworthy.

Finally, the American Watch Company, disgusted with the degraded condition to which the trade had sunk, resolved to make an honest and determined effort to restore it to public confidence. They accordingly determined to establish the "Sterling" standard for their silver cases, and that thenceforward, whoever should buy a Waltham silver watch case should have his money's worth; and in order that customers should know just the quality of silver they were buying, they stamped upon the inside of their cases the word "Sterling," together with their trade mark, "American Watch Company." While they thus fixed the highest standard for their cases, and guaranteed it by staking their reputation on its genuineness, they *did not advance the price of silver cases.* They simply resolved to deal fairly and honestly with the public and with the trade, by stamping their goods at their actual and precise value. This did not increase the cost of the cases to them—for their goods had always been of the highest quality—and, consequently, there was no occasion for them to advance their prices. What they did was to give every purchaser a satisfactory assurance that he was getting what he paid for—a "Sterling" Silver watch case. The reputation of the company was so high that all that was required was their simple guarantee that the cases were made by them and were of their standard make. This requirement was fulfilled by stamping on each case the word "Sterling," and their trade-mark.

Are dealers in watches aware of the fact that they can now buy a fine Waltham silver watch case of the best quality of workmanship made of "Sterling" silver, and each case accompanied by the written guarantee of the American Watch Company that it is precisely what it purports to be, at just as low a price as the cheaply-made "three-cent piece quality" can be bought for.

In all markets of the world "Sterling" is the standard for silver. It is a good old Anglo-Saxon word, and, according to Webster, means genuine, pure, true, real, positive, substantial, It was first applied to coin in England, because the English coin had a fixed standard of value; it was something genuine, real, substantial. From this fact, the word "Sterling" has become a synonyme, wherever the English language is spoken, for all that is inflexibly good and trustworthy. Hence, it very properly represents the standard value of the American Watch Company's silver watch cases—they are "Sterling" in every particular, intrinsic value and workmanship. For this reason there is an increasing demand in foreign countries for Waltham watches, the quality of the cases being so fine and so trustworthy as to furnish, to a considerable extent, a guarantee of the quality of the movements they contain. Our own people may well take a hint from their transatlantic neighbors in this respect. While Americans are free to admit the superiority of the Waltham watches, they pay too little heed to the external covering of the movements. As a consequence, superior movements are often found in cheap cases made by other manufacturers, and lacking the trade-mark and guarantee of the American Watch Company. The silver of which such cases are composed may be of any quality, from "coin" of the three cent piece variety, to the "one per cent. alloy" previously alluded to. Such cases, independent of the watch, have but little market value, inasmuch as they contain vastly "more copper than conscience." The workmanship may be fair enough to look upon, but the case itself, lacking the "Sterling" quality of purity and genuineness, is but a hollow mockery—a delusion and a snare.

Are Americans to remain content to wear in their pockets watch cases of a debased quality, while all foreigners reject anything below the "Sterling" standard? As we have shown, there is no necessity for their doing so. Genuine "Sterling" watch cases can be had for the same price as the cheap, unserviceable, fraudulent imitations. To get the genuine, and to be certain that they have got cases of superior quality of silver, manufactured and guaranteed by thoroughly reliable parties, purchasers have but to look inside for the word "Sterling" and the trade-mark of the American Watch Company.

American Watch Company.

The New Model BROADWAY.

The best watch for the money ever offered! We have entirely remodeled them with the following special advantages.

The barrel does not project beyond the top plate, thus allowing a plain, tighter-fitting dust band to be used.

The pottance is immovably fixed in the plate, and need never be disturbed. With this pottance so placed it is impossible for the balance to get out of upright, and it is a convenience for repairers. This valuable improvement is secured by patent.

The angles of the pallet jewels, on both sides of the pallet, are the same, and the jewels are interchangeable, which is also convenient for repairers. By this means the whole escapemeat has been improved.

An improved arrangement for letting down the mainspring without taking off the hands and dial. The barrel can be removed by simply taking off he barrel bridge.

The dials are firmly secured by screws.

The hair-spring stud is in the cock, so that balance and cock can be taken off and replaced without danger of changing the rate of the watch.

All the wheels and pinions run in the solid plate in jewels or otherwise, the third bridge being abandoned, so that no part of the train can get out of upright.

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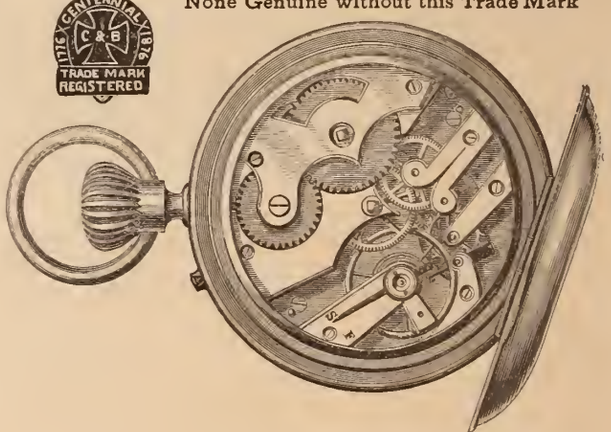
Makers and Importers of SWISS WATCHES,

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The CENTENNIAL WATCH (Stem-Winding and Stem-Setting) so universally popular, has achieved a standard reputation, and is generally conceded to be the best made watch for the money in this market. Being the sole manufacturers of this celebrated Timekeeper, we are enabled to give it our strong st endorsement. Especial attention is called to the "HENRY BEGUELIN," "DROZ & PERRET," and other well known Swiss Watches, as well as to our full and complete line of all grades of American Watches, on which we give the full trade discount.

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None Genuine without this Trade Mark



The above is a fac-simile of the Centennial Watch.

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Finest Quality of Electro-Plated Flat Table Ware.

PATENTED HEAVY SPRING TEMPERED SHANK ON FORKS AND SPOONS.

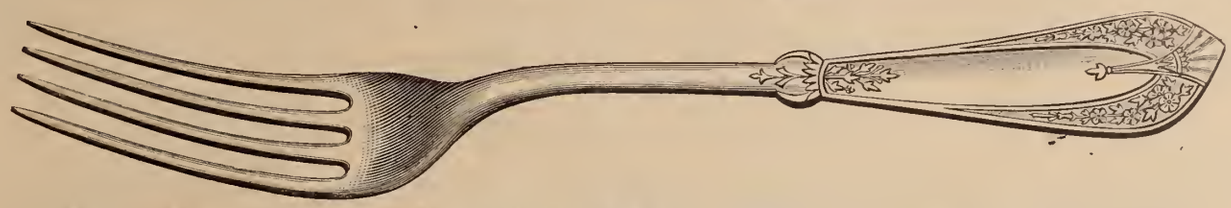
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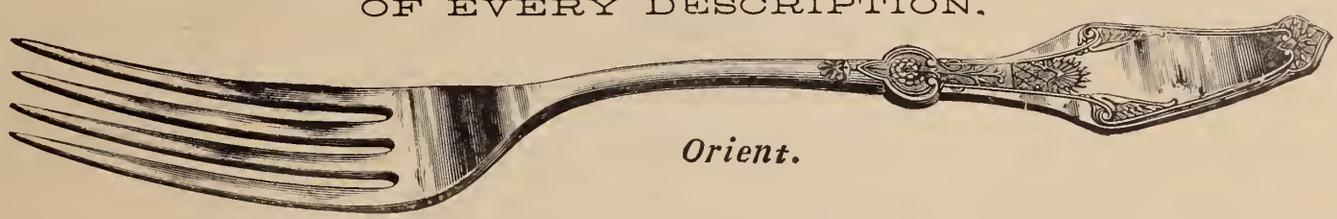
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OF EVERY DESCRIPTION.



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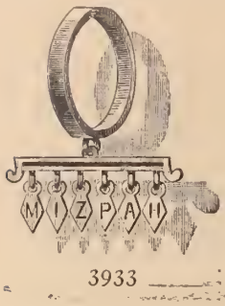
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Factory, 12 Rue St. Pierre, Chaux de Fonds, (Suisse.) Established 1847.

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☞ *All Watches fully Warranted as to quality of Movements and Cases.*

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Manufacture CHEMICALLY PURE COPPER for ALLOYING, and are prepared to fill orders for same, either in the Wire, Strip or Granulated form. Its PURITY has been attested as follows.

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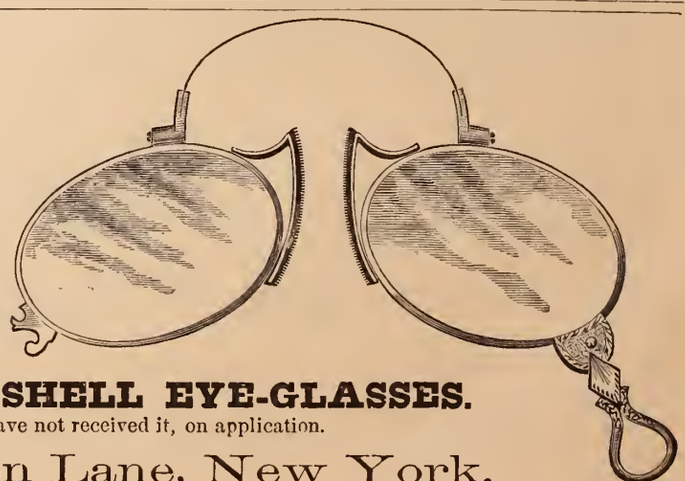
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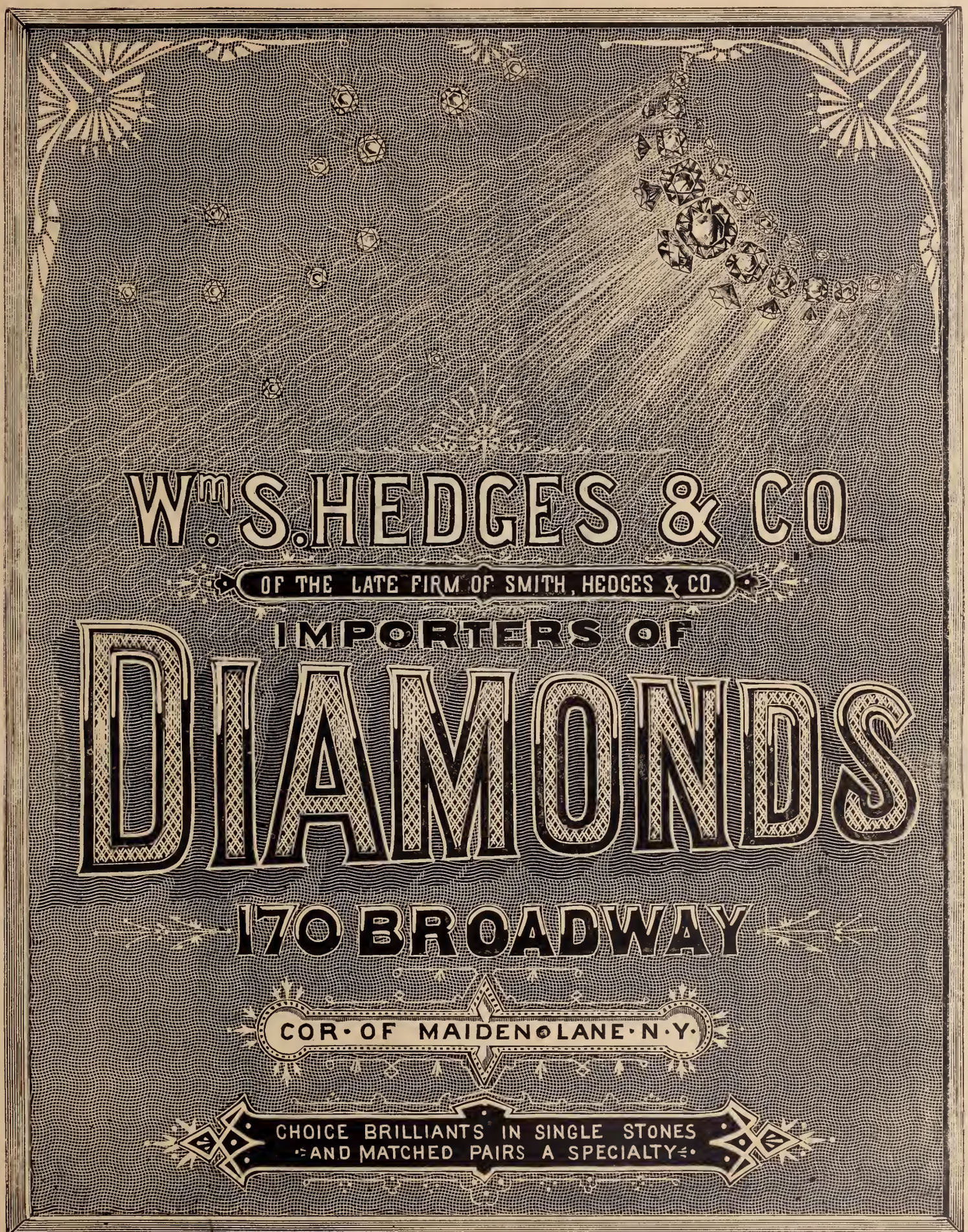
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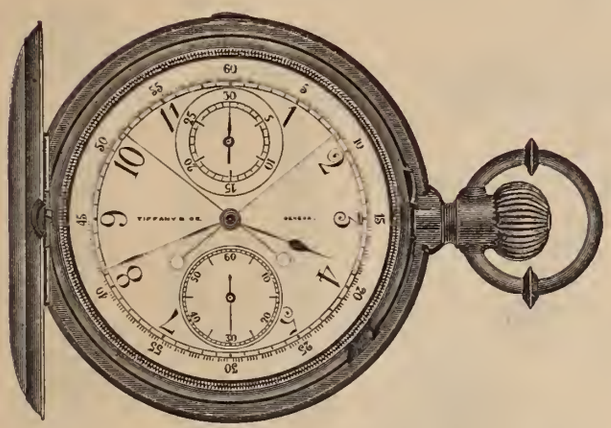
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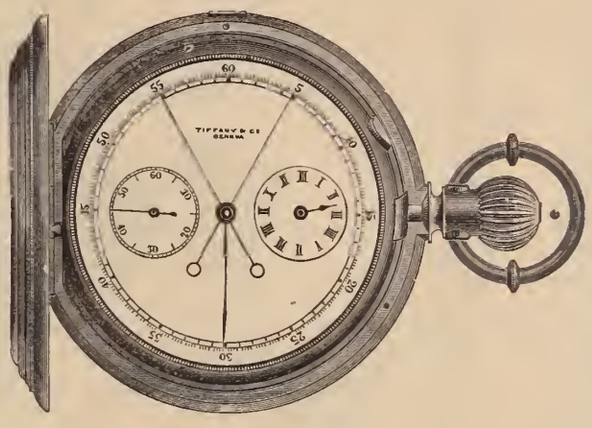
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REPEATERS, striking hours, quarters and minutes. REPEATERS, striking hours and five minutes. CALENDAR Watches showing on the dial the month, day of the month and week, and changes of the moon. CHRONOGRAPHS and REPEATERS combined, and many others never before imported.

Our LADIES' WATCHES are of all sizes, beautifully cased in 18kt. Gold, plain (red or yellow), Engine-turned, Carved, Enameled, Jeweled, Inlaid, in Hunting, half-Hunting, Open-Face, Flat, Knurl-edge, Louis XIV., XV., XVI., Jurgensen and Frodsham styles.

Each and every movement is finished under our own supervision, by thoroughly skilled hand labor, and finely adjusted to temperature and positions. After being cased they are submitted to severe adjustment tests for at least thirty days, and then guaranteed by us to be "as fine time-keepers to carry as are made."

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ALL Watches of our make have the firm name "TIFFANY & Co." engraved upon the movements, and the trade are cautioned against apparent fac-similies put upon the market by certain *unscrupulous* dealers. The TIFFANY Watches are cased in 18 KARAT GOLD, have an established *retail* price, and we *positively* refuse further supplies to anyone underselling them.

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The odd feature about the timepiece represented above, is that the Clock oscillates while the pendulum is stationary, thus reversing the usual order of things; we are the SOLE AGENTS.

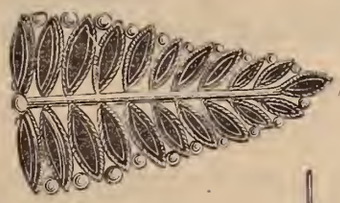
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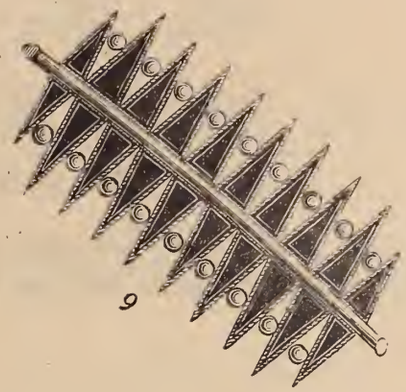
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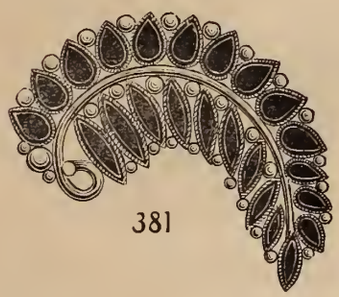
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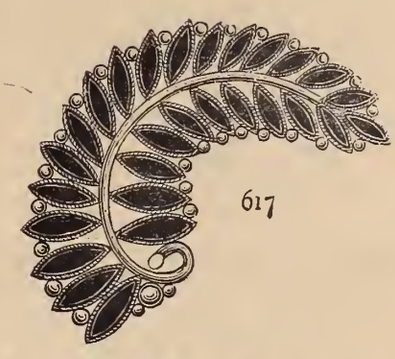

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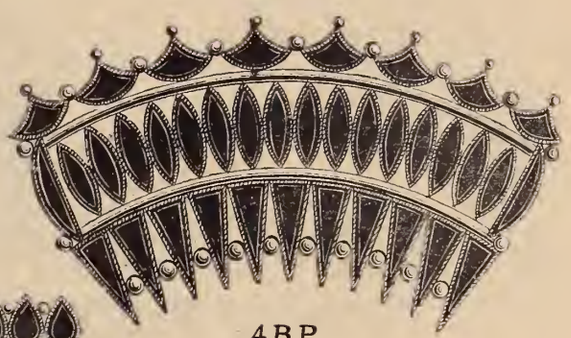

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6 B.P.


4 B.P.




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671

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Rockford Watch Comp'y







Nine grades of Key and Stem-Winding, Quick Train Movements.



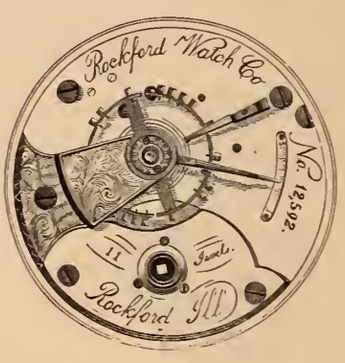




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☞ A special feature of these Movements, and one which has greatly commended them to Railroad Men, by whom they are now largely used, is the fact that the cheaper as well as the finer grades all have the QUICK TRAINS.

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Also Sole Agents for ABBOTT'S PATENT STEM-WINDING and STEM-SETTING ATTACHMENTS for OPEN FACE WATCHES, with Fig XII at pendant and Second-hand opposite.

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AMERICAN PEDOMETER.

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This instrument accurately measures the distance a person carrying it walks, showing the amount of daily exercise taken in and out of doors.

It's mechanism is a marvel of simplicity, and can be adjusted to any length of step. It is strong and durable, and the size of a small watch. Ladies, Professional and Business Men, Students, Pedestrians, Sportsmen, Farmers, Surveyors, and others will find it very useful. A Table accompanies each Pedometer, giving the number of steps taken in a mile, second, minute, hour and day. Retail Price, $5.

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THE TRADE SUPPLIED AT WHOLESALE ONLY BY **TIFFANY & CO., 14 John Street, New York.**

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MANUFACTURERS OF

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PEN AND PENCIL CASES.

AWARDED
THE ONLY
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Also, the Highest Medal
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American Institute 1849
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American Institute 1852
American Institute 1853
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South Carolina Institute 1870
North Carolina Institute 1870

110 WILLIAM STREET, NEW YORK.

TO THE TRADE.

EXTRACT FROM LETTER OF E. W. TRASK.

Dated Aurora, Ill., September 28th, 1878.

MESSRS. NICOUD & HOWARD,

Gentlemen:

* * * * * * * *

It is my experience, and I find it is the experience of all the retail Jewelers of my acquaintance, that the prospects of the **Swiss Watch** *business were never brighter for fine and medium priced goods. We cannot sell an American Watch to a railroad man if he wants anything above a very cheap grade.*

I think that the Americans have to a certain extent captured the trade, and perhaps will hold it on cheap goods, but for finer trade are losing ground as fast as they can, and to give my experience in this direction: a year or so ago we used to sell dozens of B. W. Raymond movements, and I have not sold one in the last nine months, and every one without a single exception to whom I have sold **NICOUD Watches** *is pleased, and I wish I could say the same of Walthams and Elgins.*

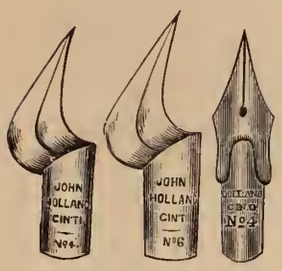
People are inquiring after better watches than they have been buying, and we have no trouble to sell fine **NICOUD Watches** *in place of cheap Americans, as the trade used to run.*

NICOUD & HOWARD,

SOLE IMPORTERS OF THE NICOUD WATCHES,

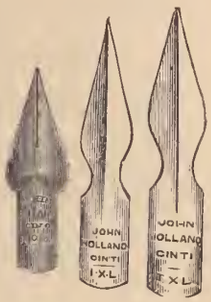
14 JOHN STREET, (P. O. Box 2269.) NEW YORK.

——Established 1842.——



JOHN HOLLAND,

Manufacturer of Patent "Record," Barrel, Falcon, Stub, and all styles of Long Nib Gold Pens.



Fine Solid Gold Pen and Pencil Cases, Pearl, Ivory and Fine Wood Pen Holders, Charm Pencils & Gold Tooth Picks.

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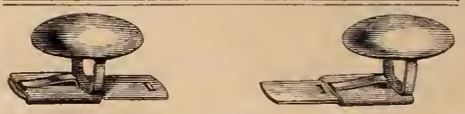
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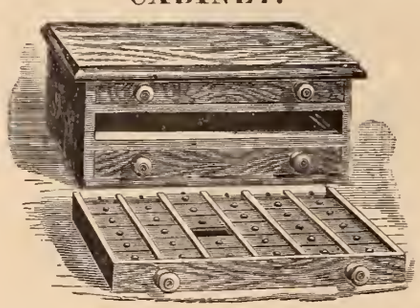
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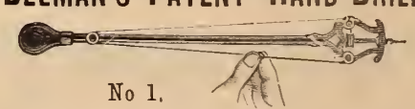
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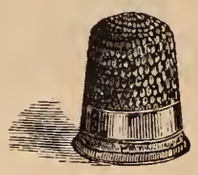
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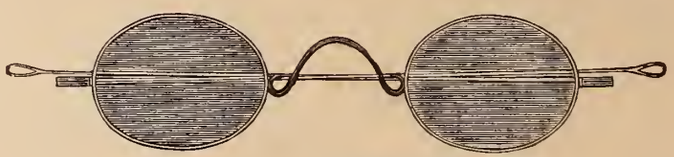
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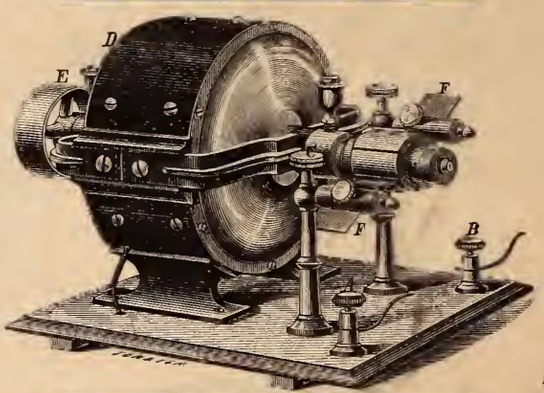
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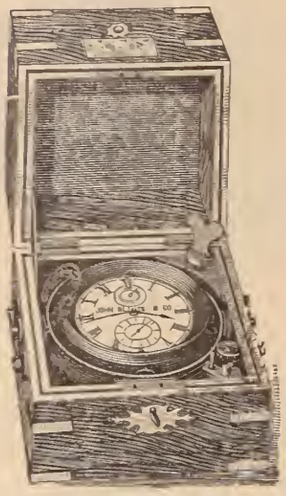
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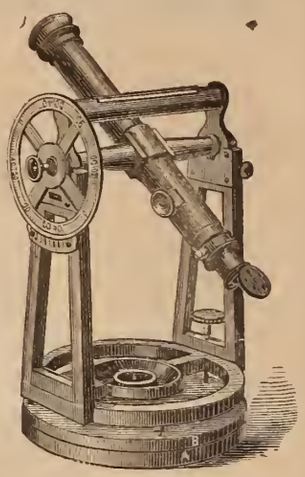
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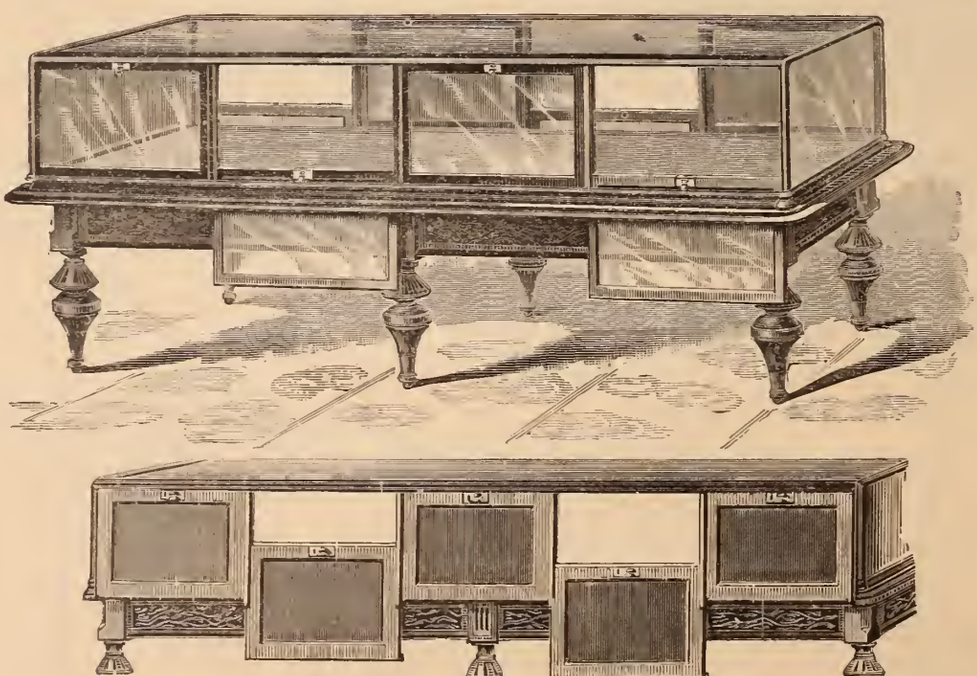
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WANTED to make an arrangement with a responsible party with a stock of jewelry, etc , or with a New York house who would consign on commission. This is a good chance for an invalid who wishes to spend a winter in he South. Address, Florida, Jewelers' Circular.

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Celluloid Novelty Co.—Manufacturers of Imitation Coral Jewelry, 4 Maiden Lane.

Jewelry Glasses.

Brown, Edwin — Lapidary. Manufacturer of Glasses, for all kinds of Jewelry, Clocks, Chronometers, &c. Glasses bent to any shape. No. 85 Nassau st.

Jewelers' Boxes.

Dennison Mfg. Co.—Manufacturers of Jewelers Findings, Paper Boxes, Cards, Tags, Cottons, Tissue Papers, &c., 198 Broadway, N. Y.

Frasse & Co.—Importers of Stubs, French, Swiss, German and Sheffield Tools, Files and Steel Wire for Watchmakers, Jewelers, etc., 62 Chatham street, N. Y.

Hammel, L. & Co.—Importers of Materials and Tools for Watchmakers, Jewelers and Engravers—also Optical Goods, &c., 9 Maiden Lane, N. Y.

Zimmern, Henry—Importer of Watch Materials, Tools, Glasses, Silk Guards, Silver & Plated Chains, Optical & Fancy Goods, 8 Maiden L

Lapidaries.

Kordmann & Michel—Lapidaries, dealers in Precious Stones. Rubies, Sapphires and Peridots cut. No. 32 Maiden Lane.

Musical Boxes.

Paillard, M. J. & Co—Importers & Manufacturers of Musical Boxes, No. 680 Broadway, N. Y.

Opticians.

Burbank Manf'g Co.—Manufacturers of Spectacles and Eye Glasses of all descriptions, in gold, silver, etc., 14 Maiden Lane, N. Y.

Du Bois, Geo. W.—Successor to A. Landsberg, Importer and Manufacturer of Optical Goods 36 Maiden Lane, Box 3993, N. Y.

Hammel, L. & Co.—Importers of Spectacles, Opera and Marine Glasses, Telescopes, Microscopes, Optical & Fancy Goods, 9 Maiden L.

Laurencott, J. B.—Importer of Watch Glasses, Optical and Fancy Goods, Clocks, Bronzes, etc., 33 Maiden Lane, N. Y.

Lorsch, Albert—Manufacturer of the Patent Accommodating Spectacles and Eye Glasses in Gold, Silver and Steel, and other Optical Goods, 37 Maiden Lane, N. Y.

Spencer Optical Manufacturing Co.—Gold, Silver, Steel and Nickel Plated Spectacles, Eye Glasses, &c. 13 Maiden Lane, N. Y.

Suttie, Wm. J.—Manufacturer of Eye Glasses and Spectacles, in gold, silver, steel and shell, (Price List by mail), 39 Maiden Lane.

Precious Stones, &c.

Bissinger, Philip—Importer of Diamonds, Pearls and Precious Stones. Agent for the Bohemian Garnet Goods. No. 22 John St., N. Y.

Gruet, Jules.—Importer of Precious and Imitation Stones, Amethysts, Topazes, Cameos, Garnets, Doublets, Imitation Diamonds, Pastes, etc., No. 14 John street. Manufactory at Septmoncel, France.

Meyer, Francis Ed. —Successors to John B. Behrmann, Importer of Imitation Precious Stones, all sizes and shapes constantly on hand. No 38 Dey street, P.O. Box, 1981.

Rings and Shanks.

Bryant & Bentley..Manufacturing Jewelers, 350 Patterns Hard Solder Rings, 12 Maiden Lane

Knapp, C.—Manufacturer of Band Rings of 14 and 18karat, Gold Shanks & Heads for Rings. 41 Maiden Lane.

Silverware.

Gorham Manufacturing Co.—Union Square.

Whiting Manufacturing Co.—Manufacturers os Sterling Silverware, cor. Broadway & 4th st.

Wood & Hughes.—Manufacturers of Fine Silver ware. 14 John Street, N. Y.

The Adams & Shaw Co.—Manufacturers of Silverware. Cor. Broadway & 4th St., N. Y.

Silver Plated Ware.

Hall, Elton & Co.,—Manufacturers of the Finest Electro-Plated Ware, salesroom, 75 Chambers street, N. Y.

Holmes, Booth & Haydens—Manufacturers of Silver-plated Ware. 47 Chambers street.

The Adams & Shaw Co.,—Silversmiths, Whiting Building, cor. Broadway & 4th street, N. Y.

Meriden Britannia Co—Manufacturers of Silver plated Ware, Union Square, N. Y.

Middletown Plate Co.—Manufacturers of Superior Electro-Plate. Factories, Middetown, Conn., Salesroom, 13 John Street

Manhattan Silver Plate Company.—Manufacturhrs of every description and quality of Silver Plated and Bronze Ware, office No. 952 Broadway. Factory 382 to 390 2d Ave.

Reed & Barton—Manufacturers of Fine Plated and Table Ware, of every description, 686 Broadway, N. Y.

Rogers & Bro. — Manufacturers of the finest quality of Electro-Plated Ware. 690 B'way.

Simpson, Hall, Miller & Co.—Manufacturers of Fine Silver Plated Ware, No. 676 Broadway

Webster, E. G. & Bro.—Manufacturers of Fine Silver Plated Ware. Office and Warerooms, 14 Maiden Lane, N. Y.

Show Cases, Etc.

Kelly, P. J.—Manufacturer of all kinds of Show Cases, Counters and Refrigerators, No. 50 New Bowery, N. Y.

Kraft & Hoffmeister—Manufacturers of Metal Show Cases, Jewelry Trays always on hand, 8 & 13 North William street, N. Y.

Smith, B. & W. B,—Patent Improved Counter Show Cases. Drawings furnished and estimates given for fitting stores in Cabinet Work complete.

Spectacle Case Manufacturers.

Koenen, A. & Bro. Manufacturers of Leather Spectacle & Eye Glass Cases, 81 Nassau St., N.Y

Thermometers Etc.

Tagliabue, Giuseppe—Thermometer, Barometer and Hydrometer Manufacturer, 302 Pearl street near Beekman, N. Y

Thimble Manufacturers.

Burbank Manufg Co.—Manufacturers of Gold & Silver Thimbles, 14 Maiden Lane, N: Y.

Ketcham & McDougall—Improved Gold and Silver Thimbles, Nos. 4 and 6 Liberty Place, near Maiden Lane, N. Y.

Walking Canes.

Fradley, J. F.—Manufacturer of Fine Gold and Silver-headed Walking Canes and Sterling Silverware. Office and Factory, No. 21 John street, N. Y.

Watch Companies.

American Watch Co.—Robbins & Appleton, No. 9 Bond street, N. Y.

Hampden Watch Co.—of Springfield, Mass. Office, No. 12 John St., New York.

Springfield Watch Co.—Factory, Springfield, Ill. Office, 11 Maiden Lane.

Tiffany & Co.—Makers of Fine and Complicated Watches. Office 14 John street, N. Y.

Watch and Chronometer Jeweler.

Queen, James—Watch and Chronometer Jeweler and Pallet Maker, 78 Nassau street, Room 8. Pivots inserted in Pinions, Balance, Staffs, &c.

Watch Importers, Etc.

Aikin, Lambert & Co.—Importers of Watches, Sole Agents for Paul Breton & Chas. Latour, Geneva. A general line of reliable Swiss Watches. Watch Cases of all styles made to order. 12 Maiden Lane, N. Y.

Bartens & Rice—Importers of Watches, Watch and Chrometer Makers. No 3 John street.

Beguelin, Tell A.—Importer of Watches, Watch Materials, Tools, etc. No. 71 Nassau St.

Bodine, G. M.—Importer and Dealer in Watches and Jewelery, etc., also Agent for Bard & Bros.', Gold Pens & Pencils, 22 Maiden Lane.

Bourquin Brothers—Importers of Watches from their own manufactory at Bienne, Switzerland, 20 Maiden Lane, N. Y.

Bynner, T. B.—Importer and Jobber of Watches, Diamonds and Fancy Goods, and dealer in the best class of Rolled Plate Jewelry. 513 Broadway.

Cross & Beguelin—Importers of Watches, Watch Tools and Materials, dealers in American Watches, No. 21 Maiden Lane, N. Y.

DuBois, Francis & Co.—36 Maiden Lane, N. Y., Importers of Watches and Manufacturers of Watch Cases.

Droz, Henry E.—Importer of Watches and Watch Case manufacturer. Agent for the "E. Perregaux" Watch, and jobber in American Watches, No. 92 Fulton Street, N. Y.

Freund Max & Co.—Importers of Watches Jewelry and Precious Stones, 8 Maiden Lane

Gagnebin, Chas.—Importer of all kinds of Watches, 64 Nassau Street. Agent for Ulysse Breting's Fine Chronometers, Chronographs, Anchors, etc.

Gallet, Julien—Importer of Watches. No. 25 John Street.

Ginnel, Henry—Importer of Watches, Tools and Materials. No. 31 Maiden Lane, N. Y. P. O. Box, 2967

Keller, L. H. & Co.—(Successors to G. A. Huguenin,) Importers of Fine Watch and French Clock Materials, No. 64 Nassau street, N. Y.

Hyde's Sons, John E.—Wholesale Commission Agents only, for Jules Jurgensen, of Copenhagen, Ed. Perregaux, Locle, Morard Freres, Geneva, Watches, and of other makers of every quality. No. 22 Maiden Lane

Kahn, L. & M.—Importers of Watches, No. 10 Maiden Lane, New York.

Mathez, F. H.—Importer of Watches. No. 5 Maiden Lane, N. Y.

Magnin, Ve J. Guedin & Co.—Importers and Agents of the Nardin Watch, No. 652 B'way

Mathey, L. & A.—Importers of Fine Watches and Sole Agents for the **H. L. Matile's** Watches, No. 119 Fulton Street, N. Y.

May & Stern—Importers of Foreign Watches, Materials and Tools, etc. Manufacturing Jewelers. No. 19 John St., N. Y.

Nicoud & Howard,—Importers and Manufacturers of Watches, No. 14 John street, N. Y.

Oppenheimer Bros. & Veith, Dealers in Watches and Diamonds, and Manufacturing Jewelers. No. 35 Maiden Lane, N. Y.

Quinche & Krugler.—Agents for the Borel & Courvoisier Nickel Movements, 17 Maiden Lane, N. Y.

Robert, J. Eugene—No. 30 Maiden Lane, New York Agent for Louis Audemar's celebrated watches.

Schwob, Adolphe—Manufacturer & Importer of Watches, 11 Maiden Lane, N. Y.

Saltzman, A.—Manufacturer and Importer of Fine Swiss Watches, 15 Maiden Lane, (up stairs,) N. Y. Factory, Chau de-Fonds, Switzerland.

Stern Brothers & Co.—Importers of Swiss Watches and wholesale dealers in American Watches, &c., 30 Maiden Lane.

Scott, J. T. & Co.—Importers of Watches, and Manufacturers of Jewelry, and Jobbers of all grades American Watches. No. 11 Maiden Lane, N. Y.

Strasburger, Louis & Co.—Importers and Makers of Watches of every description. No. 15 Maiden Lane.

Tiffany & Co.—Makers of Watches. General Agents for Patek, Phillippe & Co. Wholesale office, 14 John street, N. Y.

Watch Cases.

Brown, J. A. & Co.—Manufacturers of The Ladd Patent Stiffened Gold Watch Cases, &c., 11 Maiden Lane, N. Y. Factory, 58 Eddy street, Providence, R. I.

Glatz, Charles—Manufacturer of Gold and Silver Watch Cases. 12 Maiden Lane.

Laurent, J.—Watch Case Manufacturer, Gold and Silver American Watch Cases constantly on hand. 17 John street, N. Y.

Watch and Chronometer Repairer.

Cerf, B.—Practical Watchmaker and Repairer, No. 10 John street, N. Y. Repairing and adjusting of Fine Watches done for the trade. All kinds of escape and stem winding wheels cut to order.

Ludeman, W. H.—Chronometer and Watchmaker. Repairing of every description for the Trade. 75 and 77 Nassau street, N. Y.

Sirois, A.—Practical Watchmaker, 75 and 77 Nassau street (Room 18), N.Y. Special attention paid to the repairing of Fine Watches. Pivots inserted.

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Tarbox, Hiram—Watch Case Repairing, Springing, Polishing and Engine Turning, 79 Nassau street, (room 22), N. Y.

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Watch Glasses, Shades, Etc.

Hill, Robert S.—Manufacturer of Watch Glasses, &c, dealer in Imported Glasses, Flat Glasses a specialty; also, Jeweler's Glasses. Nos. 75 & 77 Nassau street, N. Y.

PHILADELPHIA

Booz & Thomas.—Manufacturers of Gold and Silver Watch Cases and Jewelry, 108 South 8th Street, Philadelphia.

Bennett, Jacob & Son,—Diamond Setters and Manufacturing Jewelers. 108 South 8th St., Philadelphia, Pa.

Cooper & Bros.—Wholesale Jewelers, and Importers of and Dealers in Watch and Clockmakers' Materials, etc. Spectacles and Optical Goods. No. 35 South 4th St., Phila.

Conover David F. & Co.—American Watches, Wholesale Salesroom, southeast corner 7th and Chestnut streets, Philadelphia.

Herold, Chas P.—Successor to Hildebrandt, Herold & Co., Manufacturing Jeweler and Diamond Setter. Diamonds. 916 Chestnut St

H. Muhr's Sons.—Manufacturing Jewelers, Solid Gold Rings a specialty, 158 North Second st. New York Office, 11 Maiden Lane.

Kolb, G. F. & Son.—Manufacturer of fine Morocco, velvet and Cabinet Cases for jewelry watches and Silverware. 722 Sansom street.

Krider, Peter L.—Manufacturer of Sterling Silver Ware, Artisan Hall, No. 618 Chestnut street

Levy, Bernard—Manufacturers of gold and silver watch cases, and importers and dealers in Swiss and American watches, 402 Library street, Philadelphia.

McCall & Newman—Manufacturing Jewelers, Filled Plain Gold Rings a specialty, No. 625 Arch street.

Morgan & Headly. — Manufacturing Jewelers Cameo sets, Gold sets, Roman Lockets, Rings, Coral sets, and a general line of rich goods. 611 and 613 Sansom street, Philadelphia.

Pierson, Edwin,—Manufacturer of Fine Imitation Jewelry, Gold and Silver Electro-plater, Fire Gilder, Coloring, Etruscan and Gold Jewelry a specialty. 1223 Chestnut St.

Rosenthal, G. F. C.—Manufacturing Jeweler and Diamond Setter. Engraving and Designing of Monograms a Specialty. No. 924 Chestnut street, Philadelphia.

Scherr, L. A. & Co. Wholesale Dealer in Watches Silver Plated Ware, Spectacles, Fancy Goods, Watch Materials, etc., 726 Chestnut street.

Sheafer, W. H. & Co.—Makers of Fine Jewelry 908 Chestnut Street.

Simons, Brother & Co.—Manufacturers of Gold and Silver Headed Canes and Gold and Silver Thimbles. 611 & 613 Sansom St., Phila.

The Philadelphia Watch Co.—No. 618 Chestnut Street, Philadelphia. New York Agency, L. H. KELLER & Co., 64 Nassau St.

CHICAGO.

American Watch Company, of Waltham, Mass. No. 170 State street, Chicago.

Charpier & Wathier.—Watchmakers and jewelers for the trade, and dealers in all kinds of watch materials. 61 West Kinzie street.

Frese, B.—Watchmaking and Repairing for the Trade promptly attended to. Stem-winding and escape wheels cut to order. No. 99 E. Madison St., Chicago, Ill.

Purdy, J. H. & Co.—Jobbers of large and small Tools and Materials, for the use of Watchmakers, Jewelers, and kindred Trades. Spectacles—Jewelry Boxes, Plated Chains, &c., &c. No. 170 State street.

PROVIDENCE

Irons, Chas. F.—Manufacturer of Solid Gold Jewelry. Specialty Emblems, Pins and Charms Masonic, Odd Fellows, &c. 102 Friendship St.

Perkins, C. H.—Successor to Davis, Platt & Co., Manufacturer of Fine Gold Jewelry. Specialty, Ladies' Setts, Brooches and Earrings. No. 20 Conduit St., Providence, R. I.

NEWARK.

Condit, Hanson & Van Winkle.—Manufacturers of Machines for Electro-plating, &c.

Lefort, Henry.—Stem-winding Watch Crown Manufacturers. 80 & 82 Marshall St.

Lelong, L. & Bro.—Gold and Silver Refiners, Assayers and Sweep Smelters, S. W. corner Halsey & Marshall streets, Newark, N. J.

Milne & Jourdan—Manufacturers of Stem-winding Watch Crowns Nos. 13 & 15 Franklin Ave., Newark, N. J.

Prince, David—Gold and Silver Refiner, Assayer and Sweep Smelter. Sole Agent for Comin's Improved Amalgamator. 63 Railroad Ave.

Van Houten, Sayre & Co.—Manufacturing Jewelers, 53 Chestnut street, Newark, N. J.

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Standard Gold Stock Plate Chain,

NECKLACES, LOCKETS, CROSSES,

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SOLID GOLD RINGS

IN LARGE VARIETY.

N. B.—Goods on selection sent to any part of the United States on receipt of satisfactory New York reference

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Diamonds, Pearls,

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AMSTERDAM, HOLLAND.

No. 1 Gaertner Platz,
MUNICH, GERMANY.

E. AUG. NERESHEIMER,

IMPORTER OF DIAMONDS,

21 Maiden Lane,

NEW YORK.

TABLE FOR CALCULATING THE PRICE OF DIAMONDS PER CARAT AND FRACTIONAL PARTS THEREOF.

SIZE OF DIAMONDS.	1 Kt.	1-2	1-4	1-8	1-16	1-32	1-64
 10 Ct	$300.00	$150.00	$75.00	$37.50	$18.75	$9.37	$4.68
	290.00	145.00	72.50	36.25	18.12	9.06	4.53
	280.00	140.00	70.00	35.00	17.50	8.75	4.37
	270.00	135.00	67.50	33.75	16.87	8.43	4.21
	260.00	130.00	65.00	32.50	16.25	8.12	4.06
 5 Ct	250.00	125.00	62.50	31.25	15.62	7.81	3.90
	240.00	120.00	60.00	30.00	15.00	7.50	3.75
	230.06	115.00	57.50	28.75	14.37	7.18	3.59
	225.00	112.50	56.25	28.12	14.06	7.03	3.51
	220.00	110.00	55.00	27.50	13.75	6.87	3.43
 3 Ct	210.00	105.00	52.50	26.25	13.12	6.56	3.28
	200.00	100.00	50.00	25.00	12.50	6.25	3.12
	180.00	90.00	45.00	22.50	11.25	5.62	2.81
	170.00	85.00	42.50	21.25	10.62	5.31	2.66
	160.00	80.00	40.00	20.00	10.00	5.00	2.50
 2½ Ct	155.00	77.50	38.75	19.37	9.68	4.84	2.42
	150.00	75.00	37.50	18.75	9.37	4.68	2.34
	145.00	72.50	36.25	18.12	9.06	4.53	2.26
	140.00	70.00	35.00	17.50	8.75	4.37	2.18
	135.00	67.50	33.75	16.88	8.44	4.22	2.11
 2 Ct	132.00	66.00	33.00	16.50	8.25	4.12	2.06
	130.00	65.00	32.50	16.25	8.12	4.06	2.03
	128.00	64.00	32.00	16.00	8.00	4.00	2.00
	126.00	63.00	31.50	15.75	7.88	3.94	1.97
	125.00	62.50	31.25	15.62	7.81	3.90	1.95
 1¾ Ct	124.00	62.00	31.00	15.50	7.75	3.88	1.94
	122.00	61.00	30.50	15.25	7.62	3.81	1.90
	120.00	60.00	30.00	15.00	7.50	3.75	1.88
	118.00	59.00	29.50	14.75	7.37	3.68	1.84
	116.00	58.00	29.00	14.50	7.25	3.62	1.81
 1½ Ct	115.00	57.50	28.75	14.37	7.18	3.59	1.79
	114.00	57.00	28.50	14.25	7.12	3.56	1.78
	113.00	56.50	28.25	14.12	7.06	3.53	1.76
	112.00	56.00	28.00	14.00	7.00	3.50	1.75
	111.00	55.50	27.75	13.88	6.94	3.47	1.73
 1⅜ Ct	110.00	55.00	27.50	13.75	6.88	3.44	1.72
	109.00	54.50	27.25	13.62	6.81	3.40	1.70
	108.00	54.00	27.00	13.50	6.75	3.37	1.68
	107.00	53.50	26.75	13.37	6.68	3.34	1.67
	106.00	53.00	26.50	13.25	6,62	3.31	1 65
 1¼ Ct	105.00	52.50	26.25	13.12	6.56	3.28	1.64
	104.00	52.00	26.00	13.00	6.50	3.25	1.62
	103.00	51.50	25.75	12.88	6.44	3.22	1.61
	102.00	51.00	25.50	12.75	6.37	3.18	1.59
	101.00	50.50	25.25	12.62	6.31	3.15	1.58
 1⅛ Ct	100.00	50.00	25.00	12.50	6.25	3.12	1.56
	99.00	49.50	24.75	12.37	6.19	3.09	1.54
	98.00	49.00	24.50	12.25	6.12	3.06	1.53
	97.00	48.50	24.25	12.12	6.06	3.03	1.51
	96.00	48.00	24.00	12.00	6.00	3.00	1.50
 1 Ct	95.00	47.50	23.75	11,87	5.94	2.97	1.48
	94.00	47.00	23.50	11.75	5.87	2.93	1.46
	93.00	46.50	23.25	11.62	5.81	2.90	1.45
	92.00	46.00	23.00	11.50	5.75	2.87	1.43
	91.00	45.50	22.75	11.37	5.68	2.84	1.42
	1 Kt.	1-2	1-4	1-8	1-16	1-32	1-64

LOOSE DIAMONDS OF ALL SIZES AND GRADES THE SAME, MOUNTED IN EAR-RINGS, RINGS, STUDS, PINS, &c. SENT ON APPROVAL AT THE VERY LOWEST MARKET RATES.

SIZE OF DIAMONDS.	1 Kt.	1-2	1-4	1-8	1-16	1-32	1-64
 1 Ct	$90.00	$45.00	$22.50	$11.25	$5.62	$2.81	$1.40
	89.00	44.50	22.25	11.12	5.56	2.78	1.39
	88.00	44.00	22.00	11.00	5.50	2.75	1.37
	87.00	43.50	21.75	10.87	5.44	2.72	1.36
	86.00	43.00	21.50	10.75	5.37	2.68	1.34
 ⅞ Ct	85.00	42.50	21.25	10.62	5.31	2.65	1.32
	84.00	42.00	21.00	10.50	5.25	2.62	1.31
	83.00	41.50	20.75	10.37	5.18	2.59	1.30
	82.00	41.00	20.50	10.25	5.12	2.56	1.28
	81.00	40.50	20,25	10.12	5.06	2.53	1.26
 ¾ Ct	80.00	40.00	20.00	10.00	5.00	2.50	1.25
	79.00	39.50	19.75	9,87	4.94	2.47	1.23
	78.00	39.00	19.50	9.75	4.87	2.43	1.21
	77.00	38.50	19.25	9.62	4.81	2.40	1.20
	76.00	38.00	19.00	9.50	4.75	2.37	1.19
	75.00	37.50	18.75	9.37	4.68	2.34	1.17
	74.00	37.00	18.50	9.25	4.62	2.31	1.15
	73.00	36.50	18.25	9.12	4.56	2.28	1.14
	72.00	36.00	18.00	9.00	4.50	2.25	1.12
	71.00	35.50	17.75	8.87	4.44	2.22	1.11
	70.00	35.00	17.50	8.75	4.37	2.18	1.09
	69.00	34.50	17.25	8.62	4.31	2.15	1.07
	68.00	34.00	17.00	8.50	4.25	2.12	1.06
 ⅝ Ct	67.00	33.50	16.75	8.37	4.19	2.09	1.04
	66.00	33.00	16.50	8.25	4.12	2.06	1.03
	65.00	32.50	16.25	8.12	4.06	2.03	1.01
	64.00	32.00	16.00	8.00	4.00	2.00	1.00
	63.00	31.50	15.75	7.87	3.94	1.97	.98
	62.00	31.00	15.50	7.75	3.87	1.94	.97
	61.00	30.50	15.25	7.62	3.81	1.91	.95
	60.00	30.00	15.00	7.50	3.75	1.87	.94
	59.00	29.50	14.75	7.37	3.68	1.84	.92
	58.00	29.00	14.50	7.25	3.62	1.81	.90
 ½ Ct	57.00	28.50	14.25	7.12	3.56	1.78	.89
	56.00	28.00	14.00	7.00	3.50	1.75	.87
	55.00	27.50	13.75	6.87	3.43	1.71	.85
	54.00	27.00	13.50	6.75	3.38	1.69	.84
	53.00	26.50	13.25	6.62	3.31	1.65	.83
	52.00	26.00	13.00	6.50	3.25	1.62	.81
	51.00	25.50	12.75	6.37	3.19	1.59	.79
	50.00	25.00	12.50	6.25	3.12	1.56	.78
	49.00	24.50	12.25	6.12	3.06	1.53	.76
	48.00	24.00	12.00	6.00	3.00	1.50	.75
 ¼ Ct	47.00	23.50	11.75	5.87	2 94	1.47	.73
	46.00	23.00	11.50	5.75	2.87	1.43	.71
	45.00	22.50	11.25	5.62	2.81	1.40	.70
	44.00	22.00	11.00	5.50	2.75	1.38	.69
	43.00	21.50	10.75	5.37	2.69	1.34	.67
 ⅛ Ct	42.00	21.00	10.50	5.25	2.62	1.31	.65
	41.00	20 50	10.25	5.12	2.56	1.28	.64
	40.00	20.00	10.00	5.00	2.50	1.25	.62
	39.00	19.50	9.75	4.87	2 43	1.21	.60
	38.00	19.00	9.50	4.75	2.37	1.18	.59
	37.00	18.50	9.25	4.62	2.31	1.15	.57
	36.00	18.00	9.00	4.50	2.25	1.12	.56
	1 Kt.	1-2	1-4	1-8	1-16	1-32	1-64

AN ADVANTAGE TO DEALERS.—Customers ordering Goods *of me* will have the advantage of saving charges by Express on values, all Goods in transit being fully insured both ways, and no value need be stated on packages.

Orders Solicited.



French Clocks, strike, visible escapement, from $20.00 upwards.

ALBERT BERGER & CO.

IMPORTERS OF THE

W. B. & Co. Watch Glasses, Spectacles,

FRENCH CLOCKS, REGULATORS, MUSICAL BOXES, &c.

☞ *Also Lemaire & Bardour & Sons' Opera and Field Glasses.*

No. 47 Maiden Lane, New York

Factory at Goetzenbruck, Lorraine.

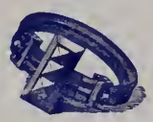
No. 21 Hatton Garden, London. No. 27 Rue-Paradis-Poissonniere, Paris.

— ESTABLISHED 1837.—

GEO. O. STREET & SON,

Makers of Fine Jewelry

126 Kearny St. San Francisco, Cal.



15 John Street, NEW YORK.



We would respectfully call attention to our PATENT EXTENSION RINGS and BRACELETS. They are strong and durable; there are no snaps and joints to get out of order; are easily expanded to admit the hand or fingers, and as easily closed by a slight pressure on the finger guides on the side.

Stone Cameo Goods, Rings, Etruscan Work, &c.

EXCLUSIVELY OF OUR OWN MAKE.

F. P. LOCKLIN,

MANUFACTURER OF

GOLD and SILVER-HEADED

Walking Canes

JEWELRY, &c.

FACTORY,

142 Fulton Street, New York

Between Broadway and Nassau street.



In placing these Oils before the Trade, we do so with entire confidence, from many years' experience in procuring them from the fish, and in their preparation for use, and more than all, the thorough and SEVERE TESTS they have been subjected to in use upon Chronometers in our whale ships, often absent from fifty or sixty months. ☞ Liberal samples furnished on application.

AGENTS—Cross & Beguelin, 21 Maiden Lane, New York; Kearney & Swartchild, 147 State street, Chicago; Glickauf & Newhouse, 120 Sutter street, San Francisco; Bowler & Burdick, 208 Superior street, Cleveland, Ohio; Heeren Bros., 30 Fifth avenue, Pittsburgh, Pa.; Louis A. Scherr & Co., 726 Chestnut street, Philadelphia; Wm. Bond & Son, 97 Water street, Boston; Robert Haswell & Son, 49 Spencer street, London.

HENDERSON & WINTER,

MANUFACTURERS OF

FINE GOLD JEWELRY

No. 15 Maiden Lane, New York.

SPECIALTIES.

STONE CAMEO, ONYX, AMETHYST, TOPAZ, PEARL AND TURQUOISE RINGS.

HENRY MAY. Established 1854. JOSEPH STERN.

MAY & STERN,

IMPORTERS OF

Foreign Watches, Materials and Tools

AGENTS FOR THE SALE OF ALL

DOMESTIC MOVEMENTS AND CASES,

And MANUFACTURING JEWELERS

No. 19 John Street, New York.

☞ **SOLID GOLD SEAL RINGS, in Cameo, Amethyst, Topaz and Onyx, A SPECIALTY.**

L. LELONG & BROTHER,

GOLD & SILVER REFINERS,

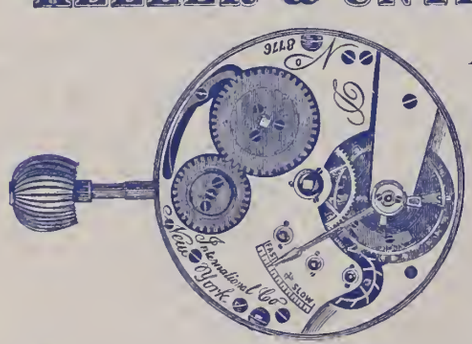
Assayers and Sweep Smelters,

S. W. Cor. Halsey & Marshall Streets,

NEWARK, N. J.

SWEEPINGS A SPECIALTY.

KELLER & UNTERMEYER,



AUTHORIZED AGENTS FOR THE SALE OF THE

INTERNATIONAL

WATCH CO.'S

WATCHES.

☞ A full and complete assortment of these goods in new and attractive Cases constantly on hand.

No. 18 John Street, New York.



P. HARTMANN,
JEWELER AND SILVERSMITH,
36 MAIDEN LANE,
NEW YORK.

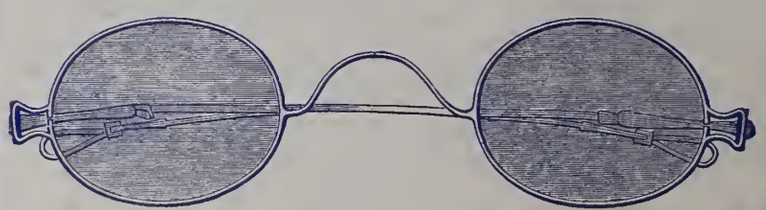
ALBERT LORSCH,

MANUFACTURER OF

PATENT ACCOMMODATING

Spectacles and Eye Glasses,

In Gold, Silver, Steel, &c.



Also Latest Novelties in Fine WATCHES & JEWELRY.

PRICES REDUCED TO SPECIE BASIS.

☞ I would call especial attention that with the above Spectacles and Eye Glasses it is only necessary to have one complete assortment of the different kinds of lenses, which being of uniform size, will interchange in all the different kinds of frames, thus giving a complete assortment for a comparatively small outlay

ALBERT LORSCH, 37 Maiden Lane, New York.

LORSCH BROS., 120 Sutter St., San Francisco. Cal.

L. & M. KAHN,

IMPORTERS OF

Sole Agents for James Kahn, E. Bourquin & Fils AND Alphonse Matile WATCHES.

WATCHES

112 Kearny St. San Francisco, CALIFORNIA.

5 Rue des Alpes, Geneva, SWITZERLAND.

No. 10 MAIDEN LANE,

NEW YORK.

☞ *Manufacturers of the* EAGLE TIMER ! *the Best in the market.*

Volume IX. No. 11
DECEMBER, 1878.



JEWELERS CIRCULAR.

D. E. HOPKINSON, PUBLISHER.

42 NASSAU STREET, NEW YORK.

The partnership between **Ethel C. Hine and Seth E. Thomas,** *for fourteen years past doing business under the firm name of AMERICAN CLOCK CO., will terminate Jan. 1st, 1879.*

After that date the headquarters of the Companies, for whom we have been agents, will be as follows :

E. N. WELCH M'F'G CO.,
WELCH, SPRING & CO., } No. 32 WARREN STREET.

NEW HAVEN CLOCK CO., No. 62 READE STREET.

SETH THOMAS CLOCK CO.,
SETH THOMAS' SONS & CO., } 20 MURRAY STREET.

We take this opportunity to thank our friends in the Trade for past favors, and to ask them after Jan. 1st, to send their orders direct to the different companies, at above addresses.

Respectfully,

AMERICAN CLOCK CO.

HINE & THOMAS.

Ansonia Clock Company,

MANUFACTURERS OF AMERICAN CLOCKS,

And IMPORTERS of CLOCKS of EVERY DESCRIPTION.

SALESROOMS: 19 & 21 CLIFF STREET, and 5 CORTLANDT STREET, (Near Broadway NEW YORK.

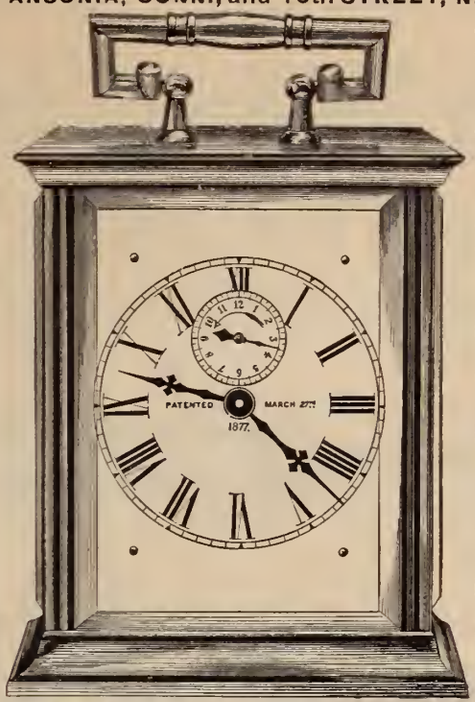
FACTORIES ANSONIA, CONN., and 10th STREET, NEW YORK.



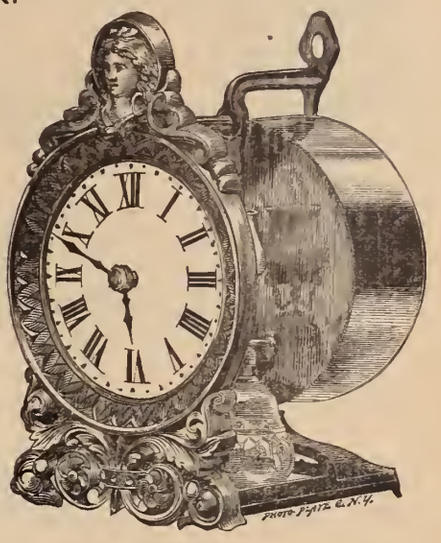
Peep O'Day Alarm.

One-half the size: Stem-Winding: Sets the alarm and winds at the back. "Only requires one spring" to be wound, and will go in any position.

CARRIAGE. Stem-Winder. Nickel or Gilt.



One Day Time, Alarm. No. 1, height, 5½ in. Eight Day Time. Only one spring to wind. No. 2, height, 4½ in. No. 3, height 3½ in.



Aladdin Night Light, Extra.

Nickel and Gilt. Stem-Winder. Patented November 1, 1877. One Day Time. Four inch dial. Height, 7 inches.

The above are excellent Time-keepers. Illustrations and prices on application.

A NEW LINE OF NOVELTIES WILL SHORTLY BE OFFERED.

Waterbury Clock Comp'y

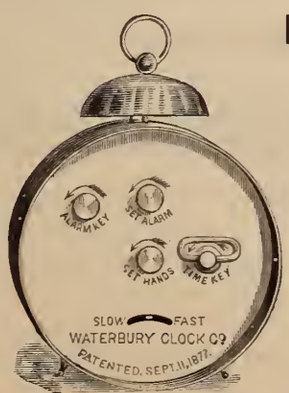
MANUFACTURERS OF AMERICAN CLOCKS,

No. 4 Cortlandt Street, New York. No. 197 State Street, Chicago.

Factories, - Waterbury, Conn.

M. BAILEY, Treas.





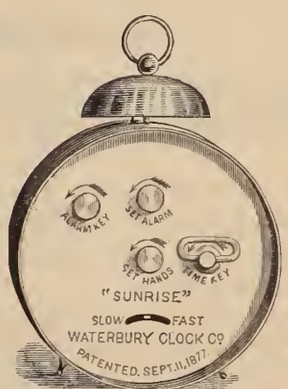
"MONITOR."

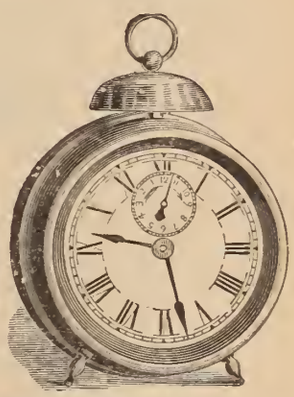
30 Hour Lever Time, Alarm Calendar.



"CRICKET."

30 Hour Lever Time.





"SUNRISE."

30 Hour Lever Time, Alarm.

☞ **Are Stem-Winders, No Keys Required, Reliable Time-Keepers, Will Run in any Position, Separate Alarm Spring Set and Regulate at the Back. Nickel-Plated Cases.**

SOLE AGENTS FOR THE ITHACA CALENDAR CLOCK COMPANY.

Illustrated Catalogues and Price Lists furnished to the Trade upon application.



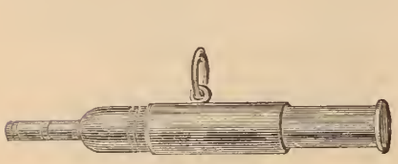
J. C. AIKIN, H. A. LAMBERT, J. B. SHEA.

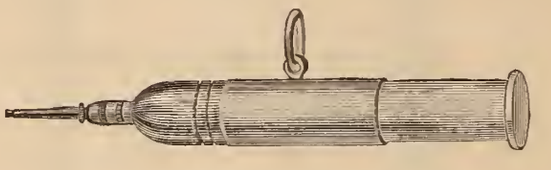
Aikin, Lambert & Co.

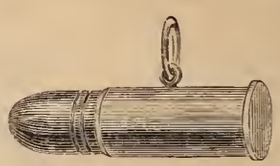


Removed to 23 Maiden Lane, New York.

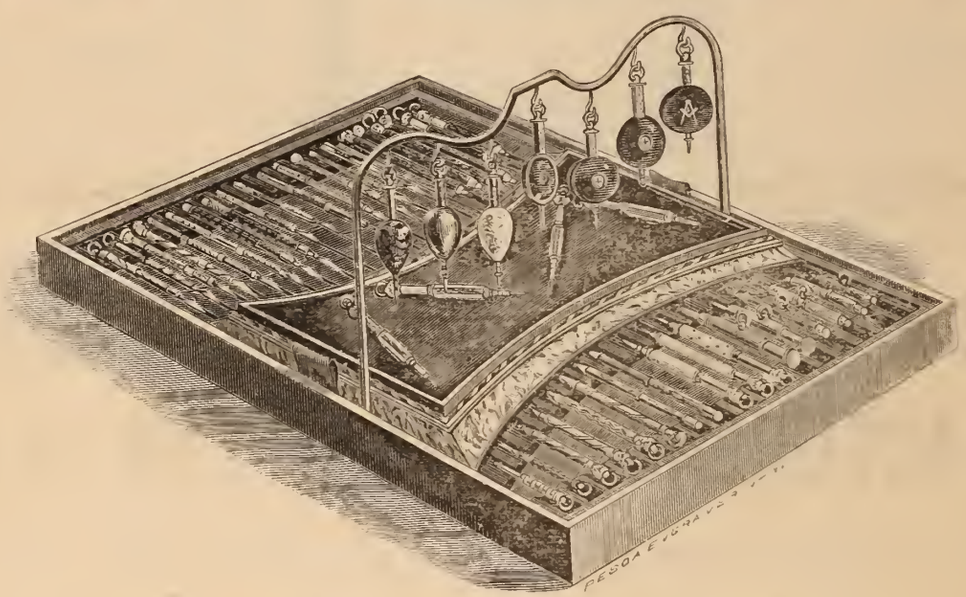
Manufacturers of Gold Pens, Pen and Pencil Cases, Pencils, Tooth Picks, and Leading "Novelties" in Pencil Goods.

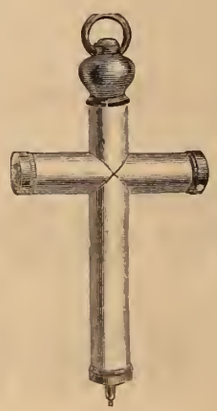












NOVELTY TRAY ASSORTMENT.





SPECIAL. ☞ Under Letters Patent we are now introducing something ENTIRELY NEW, and which we feel will meet the wants of the trade, an article that is rich, elegant and artistic in design, viz.:—The inlaying of pencil barrels in GOLD and pearl in form of vines, flowers, birds, and other unique designs on Celluloid, in imitation of malachite, agate, varigated marble, tortoise shell, also in plain assorted colors.

Also SOLID GOLD magic pencils, INLAID as above, RICH AND ELEGANT.

In connection with our leading "NOVELTIES" of last season, we show a few illustrations as above, and mention our Patented Cartridge Pencil and Watch Key, Imitation Locket (Real Stone) Magic Pencil, Imitation Locket, Intaglio and Cameo Magic Pencil, Imitation Shell Square Locket, Magic Pencil (inlaid solid gold and pearl), Imitation Shell and Malachite Magic "Ball" Pencil (inlaid solid gold and pearl), Celluloid Crystal Head, Magic Pencil, gold plated, also nickel Magic "Cross," Pencil, &c., all of which are NEW TO THE TRADE, and UNEXPENSIVE, costing but a slight advance over the ordinary goods.

☞SPECIAL ATTENTION CALLED TO OUR "NOVELTY TRAY" ASSORTMENTS, which embraces all the above goods, together with a line of Tooth Picks, in plated and gold, ranging in price from fifty ($50) dollars and upwards. The Tray arrangement is very tasty, being lined with silk and satin, and in keeping with the elegance of goods displayed.

LIBERAL AND SPECIAL INDUCEMENTS OFFERED. SEND FOR CIRCULAR AND NEW LIST.



J. C. AIKIN. H. A. LAMBERT. J. B. SHEA.

AIKIN, LAMBERT & Co.,

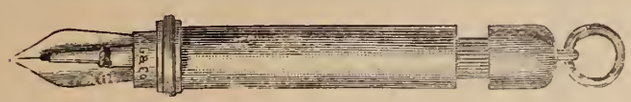
Removal to 23 MAIDEN LANE, N. Y.



MANUFACTURERS OF GOLD PENS,

Pen and Pencil Cases, Pencils, Tooth Picks,

And Leading "Novelties" in Pencil Line.





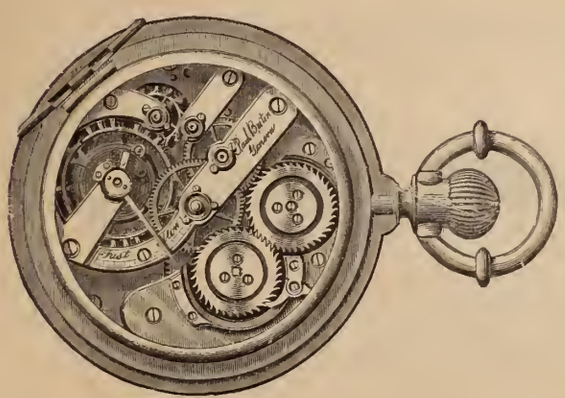
In connection with our complete line of Gold Pen and Pencil goods, we offer this season a large variety of Novelties entirely NEW to the trade, and different from any Pencil goods ever shown, all of our own patent and manufacture.

On the preceding page, we show illustrations of a portion of novelties, and invite special attention to our NOVELTY TRAY assortments, and the liberal inducements to purchasers. ☞ Send for Circular and Price List.





ALSO,



Importers of all Grades of

WATCHES.

Sole Agents for



"Paul Breton" and "Chas. Latour," Geneva.

SPECIALTIES.

AGASSIZ Movements, Gilt and Nickel, Stem-winding, fitting Ladies' Riverside Case.
CHAS. LATOUR " " " Key-winding, " 10 and 16 size Waltham Case.
PAUL BRETON " " " a full line of these CELEBRATED watches.

Metal Cased Open Face STEM-WINDING, "EXCELSIOR" and "LONGINES," 16, 18 and 20 line, the BEST metal watches, in STYLE and QUALITY, in the market. BLACK and FANCY DIALS are NOVELTIES in these watches, which are having a rapid sale.

AMERICAN WATCHES of all kinds. Gold Cases of all styles made to order. Sole Agents for EUREKA HORSE TIMER, the cheapest reliable Timer ever made, and for PNEUMATIC TIMER, which does not require the use of the hand.

We guarantee all watches sold by us, and have recently reduced our prices.

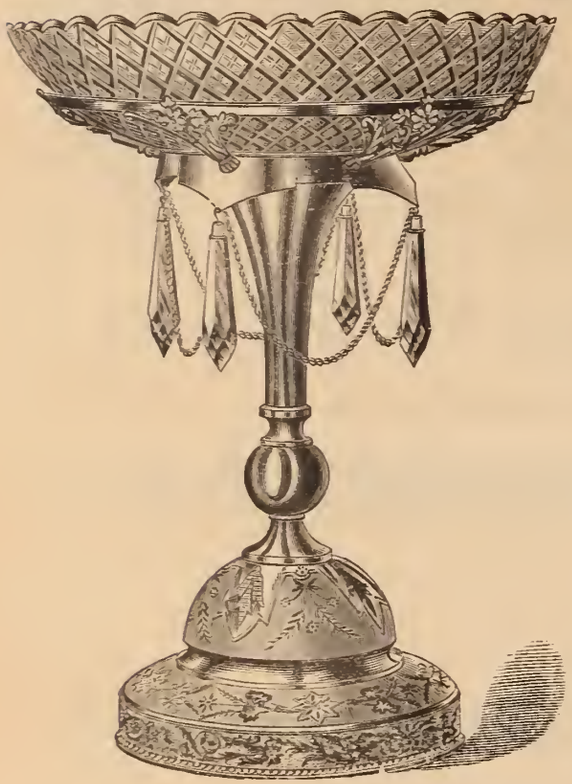
Our display of JEWELRY for the Fall Trade is complete, consisting of a general line of RELIABLE goods, both in GOLD and ROLLED PLATE, of new and tasty patterns. Special attention paid to ORDERED WORK and REPAIRS. GOODS SENT ON APPROVAL and CORRESPONDENCE invited. Those not acquainted with us will oblige by giving references when ordering.

Branch, No. 113 East Madison Street, Chicago.

SIMPSON, HALL, MILLER & CO.

Manufacturers of Fine Silver-Plated Ware,

Factories. Wallingford, Conn. Salesroom, No. 676 Broadway N. Y.



One of the oldest and most reliable manufactories in the country.

Our assortment includes a large and complete line of Hollow Ware, comprising many new and beautiful designs especially produced for the Holiday trade. The attention of the trade is particularly called to these new articles which possess the highest merits, both of construction and ornamentation. Many novelties have recently been added to our line.

Our Solid Table Ware is made of the best Nickel Silver.

SPOONS, FORKS, LADLES, PIE KNIVES, &C.

In great variety of Patterns.

Solid Steel Knives of Superior Quality.

REMOVAL.

☞ We will remove our Salesroom to No. 36 East Fourteenth Street, Union Square, about February 1st, 1879.

NOTE.—We have just issued an illustrated catalogue of our wares, which has been in preparation for several months. This book we will furnish to dealers on application.

DAVID F. CONOVER & CO.,

(SUCCESSORS TO WM. B. WARNE & CO.)

Importers, Manufacturers and Wholesale Dealers in

WATCHES AND JEWELRY.

Silver and Silver-Plated Ware,

AMERICAN WATCH WHOLESALE SALESROOM,

Southeast Corner Chestnut and 7th Sts.,

(FIRST FLOOR.)

DAVID F. CONOVER,
B. FRANK WILLIAMS,
C. EDGAR RIGHTER.

PHILADELPHIA, PA.

THE MIDDLETOWN PLATE COMP'Y,

MIDDLETOWN, CONN.

Offer a full assortment of their Superior ELECTRO-PLATED WARE

in Staple and Fancy Goods.

No. 17 Patent Jewel Box.

Cover opens by rolling on the wheels



Many Novelties for Presents !

ESPECIALLY

In Fancy Card Receivers, Vases, Jewelry Boxes, Toilet Sets, &c.

No. 13 JOHN STREET, NEW YORK.

LOUIS STRASBURGER & CO.

Manufacturers of Watches,

(From the finest Stem-Winding and Setting goods to the lowest price Watch in the market.)

And Importers of Diamonds.

We manufacture and have continually in stock a complete assortment of the best COMMERCIAL WATCHES, ranging from the lowest priced Metal and Silver Watches to the finest Gold Watches, including *Repeaters, Chronographs, Timing and other Complicated Watches.* Also specialties in all grades of NICKEL WATCHES and CASES. ☞Gold and Silver Cases constantly on hand.

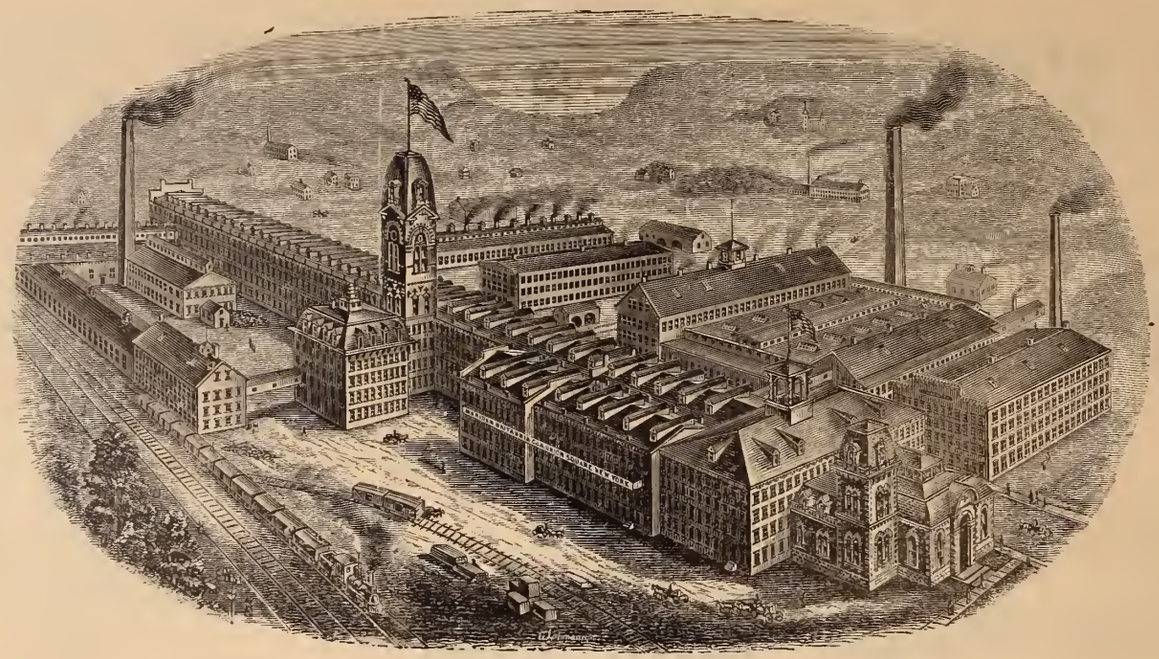
☞A full assortment of the *International* and all American Movements.

LOUIS STRASBURGER & CO.,

Salesrooms, No. 15 Maiden Lane, New York.

Diamond Bureau,
No. 30 Boulevard Haussmann,
Paris.

Watch Factory,
Rue Leopold, Chaux de Fonds,
Switzerland.



SILVER-PLATED WARE FACTORIES

OF THE

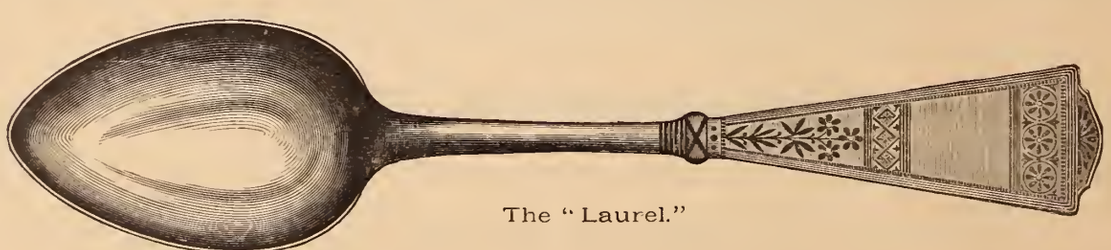
MERIDEN BRITANNIA COMPANY

WEST MERIDEN, CONN.

THE LARGEST ELECTRO-PLATED WARE MANUFACTORY IN THE WORLD!

Salesrooms, No. 46 East 14th Street,

UNION SQUARE, NEW YORK.



The "Laurel."

☞We take much pleasure in referring to the reputation we have for many years maintained for manufacturing SPOONS AND FORKS, BEARING THE TRADE MARK, "1847, ROGERS BROS."

☞Particular attention is invited to our Patented Process of Electro-Plating Spoons and Forks, by which the parts most exposed to wear receive an EXTRA coat of SILVER. This feature renders these goods more economical and durable than those of any other manufacture, while the increased cost is relatively small. This method of plating we apply to the 4, 8 and 12 oz. plate, as required ☞To protect the purchaser against imitations, it should be observed that the IMPROVED SPOONS AND FORKS bear our Trade Mark, "1847, ROGERS BROS., XII."

☞FIRST PREMIUMS awarded at all Fairs where Exhibited, from the World's Fair, 1853, to American Institute Fairs, 1873, 1874 and 1875 inclusive, and at the Philadelphia Exhibition, 1876.

Manufactories, West Meriden, Conn. Salesrooms. UNION SQUARE, NEW YORK.

WOGLOM & MILLER,

Manufacturers of Black Onyx Goods.

Our manufacturing facilities are devoted EXCLUSIVELY to the production of BLACK ONYX JEWELRY, in all the variety of form in which it can be worked for Jewelry. ☞Our stock is replete in

Bracelets, Half Sets, Brooch & Ear-rings, Necklaces, Brooches, Lace Pins,
Collar Buttons, Scarf Pins, Gents, Lace Pin Sets, Scarf Rings, Crosses,
Leontines, Link Sleeve Buttons, Cuff Pins, Shawl Pins, Ear-Rings,
Sleeve Buttons, Lockets, Gold Edge, Snaps, Ear Studs, Studs,
Vest Chains, Lockets, Deep Mourning, Glove Button Hooks, Medallions–Glass Backs,

Both in staple patterns and in novelties of form which we are continually producing from our own Original Designs.

Our BLACK AGATE (or onyx) is cut by experienced European lapidaries, beautifully polished, and mounted in gold, either plain black FOR DEEP MOURNING WEAR or tastefully ornamented with Pearls for DRESS WEAR.

Our Patented Deep Mourning Lockets have been in the market for several years, and are appreciated by the trade and the wearers, for their superior finish and durability. The correctness of the mechanical principle on which they are constructed has been satisfactorily proven by the test of years of wear.

Designs and estimates furnished for monograms, cyphers and initials in plain gold, or set with diamonds or pearls. ☞ *We are making our goods in none of their parts less than* 14 *carat.*

Our goods having all been recently subjected to extensive reductions in cost of manufacture we offer them at corresponding prices.

Office and Factory, 32 and 34 John Street, New York.

L. HAMMEL & CO.,

Importers of Watch Materials, Tools



We would respectfully call your attention to our new design of an improved Spectacle Case, which will doubtless commend itself to your favorable consideration. The improvement, consisting in the joint being on the top of the case, making it stronger and more durable than the old style of case, and the cut away for the insertion of the Spectacles renders it the most practical case made. These goods are made in all grades of leather and for all styles of spectacles, in price from $6 to $13.50 a gross, and stamped to order with name and address of the purchaser, at $2 per gross extra.

Samples sent by mail on receipt of 10 cents on application to

Opera Glasses and Optical Goods of Every Description

SPECTACLES,  EYE GLASSES

☞ We would respectfully call the attention of the Trade to the celebrated **Star Spectacles and Eye Glasses,** of which we are the Sole Importers.

No. 9 Maiden Lane, New York.

☞Sole Agents in the United States for **G. B. Wheeler's Star Watch and Clock Oil,** and the Celebrated **Gravier Mainspring.**

LEO HAMMEL. LOUIS RUNKEL.

NOVELTIES!

White Celluloid And SILVER.

White Celluloid And GOLD.



Simple, Durable, Beautiful, Economical.

COLBY & JOHNSON,

Patentees and Exclusive Manufacturers,

No. 17 MAIDEN LANE, (Box 4389), **NEW YORK.**

SEND FOR ILLUSTRATED CIRCULAR.

E. HOWARD & CO.,

MANUFACTURERS OF

Fine Watches, Regulators, Office Clocks,

Electric Watch Clocks & Tower Clocks,

Office, No. 694 BROADWAY,

Corner Fourth Street, NEW YORK.

No. 114 TREMONT STREET, BOSTON.

J. W. J. PIERSON, - - AGENT.



TINGLEY, SINNOCK & SHERRILL,

MANUFACTURERS OF

FINE JEWELRY,

NO. 5 MAIDEN LANE, NEW YORK.

Factory, Newark, N. J.

J. B. & S. M. KNOWLES,

MANUFACTURERS OF

Sterling Silverware

Office, No. 20 MAIDEN LANE,

NEW YORK.

Factory, No. 93 PINE STREET, PROVIDENCE, R. I.

MULFORD & BONNET,

MANUFACTURING JEWELERS

—AND—

JOBBERS,

No. 21 Maiden Lane, New York.

BUCKENHAM, COLE & SAUNDERS,

SUCCESSORS TO

BUCKENHAM, COLE & HALL,

IMPORTERS OF

Diamonds, Pearls

AND OTHER PRECIOUS STONES,

MANUFACTURERS OF FINE JEWELRY,

10 Maiden Lane, New York.

☞A large stock of FINE DIAMONDS, Mounted and Unmounted kept constantly on hand. Goods sent on approval to any part of the country on receipt of satisfactory references.

DENNISON MFG. CO.

MANUFACTURERS OF

Paper Boxes, Jewelry Cards, Tags,

PINK AND WHITE COTTON,

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THE U. S. STANDARD FINGER SIZE FOR RINGS.



TIME AND TROUBLE SAVED.

Some of the advantages of which, will be found annexed and must be apparent to every Jeweler.

1st. It avoids danger of having rings stolen from tray while trying on to find one the size wanted, and also of being mislaid after taking the size.

2d. It saves time consumed in measuring ring on stick and avoids possibility of making a mistake in doing so, as the size ring is guaged in accordance with the U. S. Standard Stick.

3d. It necessitates trying but one ring on the finger, whereas a dozen had sometimes to be used before the correct size was obtained.

4th. If the salesman is hurried it is not necessary to make a memorandum of the size, as the ring will remain at the size taken, and can be laid aside until some leisure time.

5th. It can be loaned to customers whereby th y will be enabled to take the correct size, instead of using pieces of string and wire, thus making mistakes and ofteo necessitating altering a ring two or three times.

HOW TO USE— Place the thumb of the hand, on which is the finger to be measured, against the joint on the size ring, and draw tight with the other hand.

☞FOR SALE BY ALL WATCH MATERIAL DEALERS

SAXTON, SMITH & CO.

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Fine Gold Chain.

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MANUFACTURERS OF

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GOODS OF OUR OWN MAKE EXCLUSIVELY.

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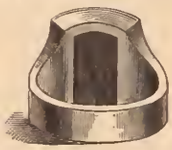
House in Geneva, 14 Grand Quai.

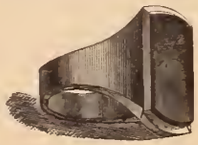
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OFFICE OF

ALFRED H. SMITH & CO.,

Of the late firm of SMITH, HEDGES & CO,

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TO THE TRADE.

In offering to you our RECENT HEAVY IMPORTATIONS *of carefully selected Goods, we respectfully call your attention to a few facts bearing upon our ability to fill your orders, to your positive advantage.*

We give to this business our EXCLUSIVE ATTENTION, *admitting to our stock no other merchandise whatsoever.*

We are DIRECT IMPORTERS *of* DIAMONDS, *so that, with us, Dealers will find original parcels to select from.*

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Exceptionally choice SINGLE STONES, *and finely* MATCHED PAIRS *will always be found with us, as well as a fine line of* MOUNTED GOODS.

Yours, Very Respectfully

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☞Also our new fac-simile of Fine African Diamonds, mounted in Rings, Studs, Pins, Ear-rings, Scarf Pins, Medallions.

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All Goods sold strictly of our own manufacture.

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For Ladies and Gentlemen, in CAMEO, AMETHYST, OXYX, TOPAZ, TURQUOISE, GARNET and other stones, Fine CAMEO, CORAL and ROMAN SETS of new and handsome designs. LOCKETS, MEDALLIONS, SHAWL and SCARF PINS, SLEEVE BUTTONS, STUDS, &c. All goods warranted.

☞We continue to manufacture several hundred patterns of **HARD SOLDER RINGS**, in every style, for men, women and children, stamped and warranted 16 carat fine.

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Having given the manufacture of Band Bracelets my entire attention for a number of years, it has been my desire to make a durable article, one that will give satisfaction to the seller as well as the wearer. I desire to call the attention of the trade to the reduction I have just made in prices, still keeping up the standard as to quality, finish and workmanship. To each pair of BANDS I attach my patent guard without extra charge—thus saving the price of chain—which for seven years past has given entire satisfaction.

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For the Movements of the various American Watch Co.'s Gent's, Ladies' and Boys' sizes, Key and Stem-Winders, and in the following styles, BASCINE, FLAT-BEVEL and MANSARD, (this latter as originally named, modeled and introduced by them) forming the most complete and varied line of elegant Cases ever offered for sale. It is now eleven years since these Watch Cases were introduced to the public, during which period of time they have steadily gained in popular confidence and esteem, as is evinced by the unprecedented fact in the history of the Watch Trade that more than FIFTY THOUSAND of them have been manufactured and sold. Made of thick plates of Gold and Nickel Composition, (this Composition is harder and tougher than any other metal except the gold itself, and suggested the term STIFFENED, originally used by us to designate this important improvement; no other case in the world is made like it;) thoroughly welded together and rolled to the required thickness—they are, while equally handsome—stronger and more durable than the finest Solid Gold Cases of the same thickness of metal, and at ONE-THIRD or ONE-HALF the COST, and with good movements, they make the cheapest, most elegant and serviceable Watches in the market. The critical examination of these good by the trade and public is invited. **FOR SALE BY JEWELERS GENERALLY**

☞Dealers can obtain them of the Wholesale Watch and Jewelry Houses, or their Traveling Agents, throughout the United States and British Provinces.

☞All genuine Watch Cases of our manufacture, have "G. W. Ladd's Patent, June 11th, 1867," stamped upon the side band underneath the glass bezel.

Refuse all others. Send for full Descriptive Circular.

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In great variety—comprising the most tasteful and stylish designs and finish, ranging in quality from the *finest made* to the *cheapest*—at prices lower than at any time since 1860.

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Gold & Hair Jewelry & Device Work,

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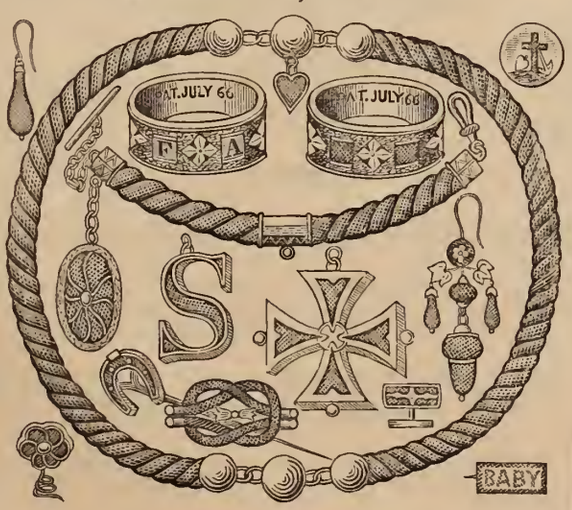
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Patentee and Sole Manufacturer of the **Patent Revolving Rings**, the design of which will be found in other pattern books. A complete stock of 14kt.

Solid Jewelry, as Stone Rings, Lockets, Studs, Buttons, etc., constantly on hand, from which I will send for selection to responsible parties.

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N.B. A LARGE STOCK OF 18 KT. DIAMOND MOUNTINGS, SUCH AS CLUSTER AND SOLITAIRE RINGS, EARRINGS, LACE PINS, SHAWL PINS, CROSSES, STUDS, AND GENTS' PINS, &c, ALL OF WHICH ARE OF MY OWN DESIGNS, AND ARE MADE IN THE FINEST STYLE AND FINISH.

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Coral, Conch Shell, Silver Filigree, &c.

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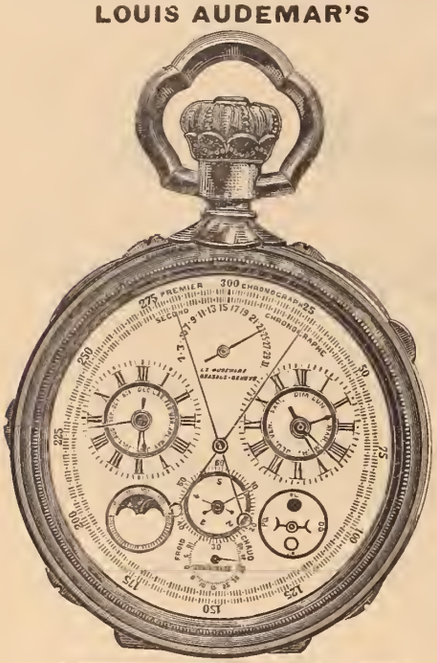
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☞ In addition to the Gold Medal awarded at the Paris Exposition, Mr. Audemar received the grand Cross of the Legion of Honor the highest distinction ever conferred on a maker of watches.

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☞Sole Agents for the Celebrated A. Schneider Watch, Dresden.

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Elegantly Mounted Bracelets, Opera, Leontine,

VICTORIA WATCH GUARDS & NECKLACES, in all the Newest Designs.

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Awarded by Centennial Com.

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MANUFACTURER OF FINE

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For Jewelry, Silver Ware, Trays, &c.

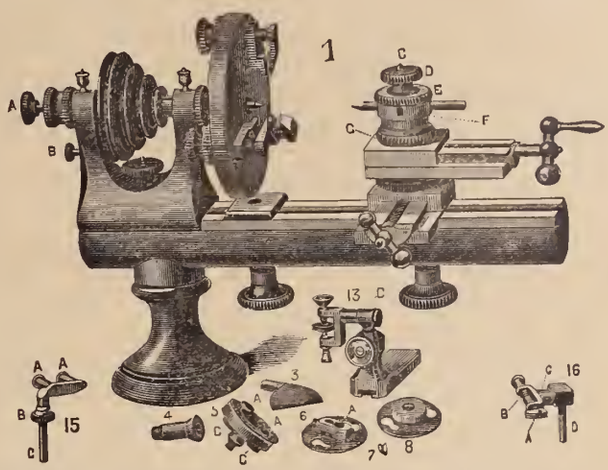
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Manufacturers of **HOPKINS' PATENT WATCHMAKERS' TOOLS**, embracing Plain and Combination Lathes, Chucks, Slide and Swing Rests, Gear Cutters, Pivot Polishers, Jeweling and Staking Tools, &c.

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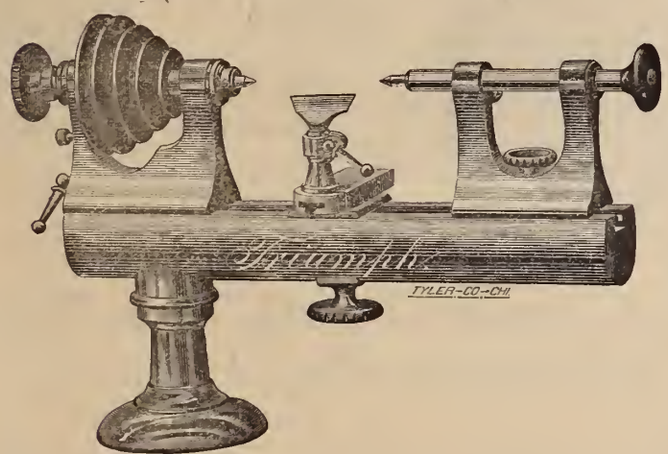
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Price, Hardened Bearings and Spindles, $40.00



☞All Split and Wire Chucks are tempered and ground, which makes them perfectly true.



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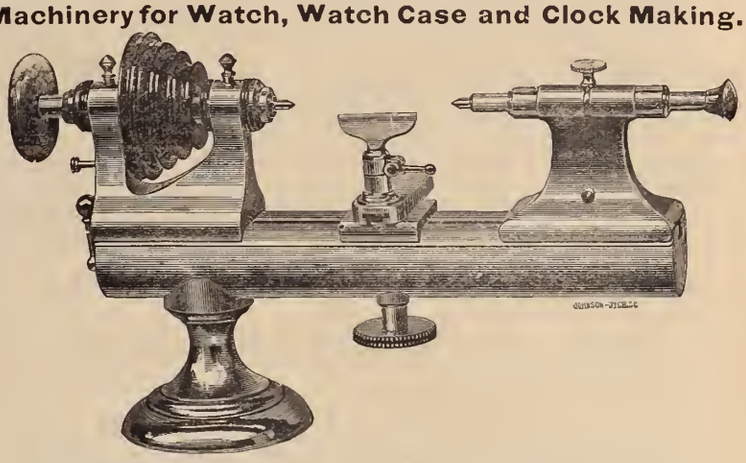
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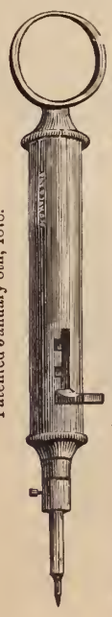


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Automatic Hammer and Punches

Simplified and More Effective.



Patented January 8th, 1878.

THIS TOOL takes the place of the third hand, therefore its manifold uses are quickly apparent, and I would only say, that it is accompanied by six punches, to wit: 2 hand punches, 1 prick punch, 1 closing hole punch, 1 rivet punch, and 1 pinion punch, all of which fit neatly into the punch holder, and are fastened by the set screw. Its tap is alternately heavy and light and the finger loops are assorted in sizes The Tool is nickel-plated and boxed, ready to be mailed on receipt of price.

THE OPERATION IS AS FOLLOWS: First, set the hammer; next insert your forefinger through the loop at the top and place the punch with firmness on your work. When you are ready for the blow, push gently on the thumb-piece which produces the concussion on the punch. *Your left hand is entirely free to hold the work.*

PRICE, $2-50 EACH.

MAX L. GUTMANN,

Patentee and Manufacturer.

Also, Importer and Wholesale Dealer in

Watch and Jobbing Materials, Tools, Glasses,

Chains, Guards, Jewelry and Watches.

☞ PLEASE SEND YOUR ORDERS. **ROCHESTER, N. Y.**

MANT'S OF FINE JEWELRY

ALLING BROS. & CO.

Full Line of Roman and Mosaic Goods,

Earrings, Buttons, Studs and Rings.

SPECIALTIES:

ENGRAVED AND ENAMELED BANDS,

CAMEO GOODS.

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CHATTERTON & DODD,

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Consisting of Sets, Pins, Ear-Rings, Lockets, Crosses, Sleeve Buttons, Studs, &c.

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ROMAN, ETRUSCAN AND ENAMEL WORK GENERALLY, SPECIALLY DESIGNED BY US.

DYER BRAINERD. JOHN W. STEELE.

BRAINERD & STEELE,

MANUFACTURERS OF

Brainerd's Pat. Lockets,





(Patented June 17, 1874.)

These Lockets combine both beauty and strength. They are made of solid 14kt. gold, and the stones used are the finest obtainable in the market. They cost no more than those of the old style if indeed as much; and the combination of secrecy and durability renders them much more desirable. We make three sizes in four different shapes—round, oval, cushion and oblong square; and also Sleeve Buttons of the same style, containing a concealed box for miniatures, a novelty new to the Trade.

FINE GOLD JEWELRY,

No. 9 Maiden Lane,

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T. GRANBERY,



Manufacturer of

BLACK ONYX



GOODS.

Patented July 16th, 1878.

This Locket is made with double glasses, in numerous shapes and sizes, shows less gold, and is lower priced than any other onyx locket manufactured.

☞ Is especially designed for Ladies' and Gents' Mourning Wear.

☞ **Coral Repairing for the Trade.**

51 Nassau Street, New York.

Platinum Tipped Diamond Settings,

Patented April 16th, 1878, by

Ripley, Howland & Co.





Office, No. 35 Maiden Lane, New York.

Factory, 383 Washington Street, Boston, Mass.

SPIESS & ROSSWOG,

MANUFACTURERS OF FINE

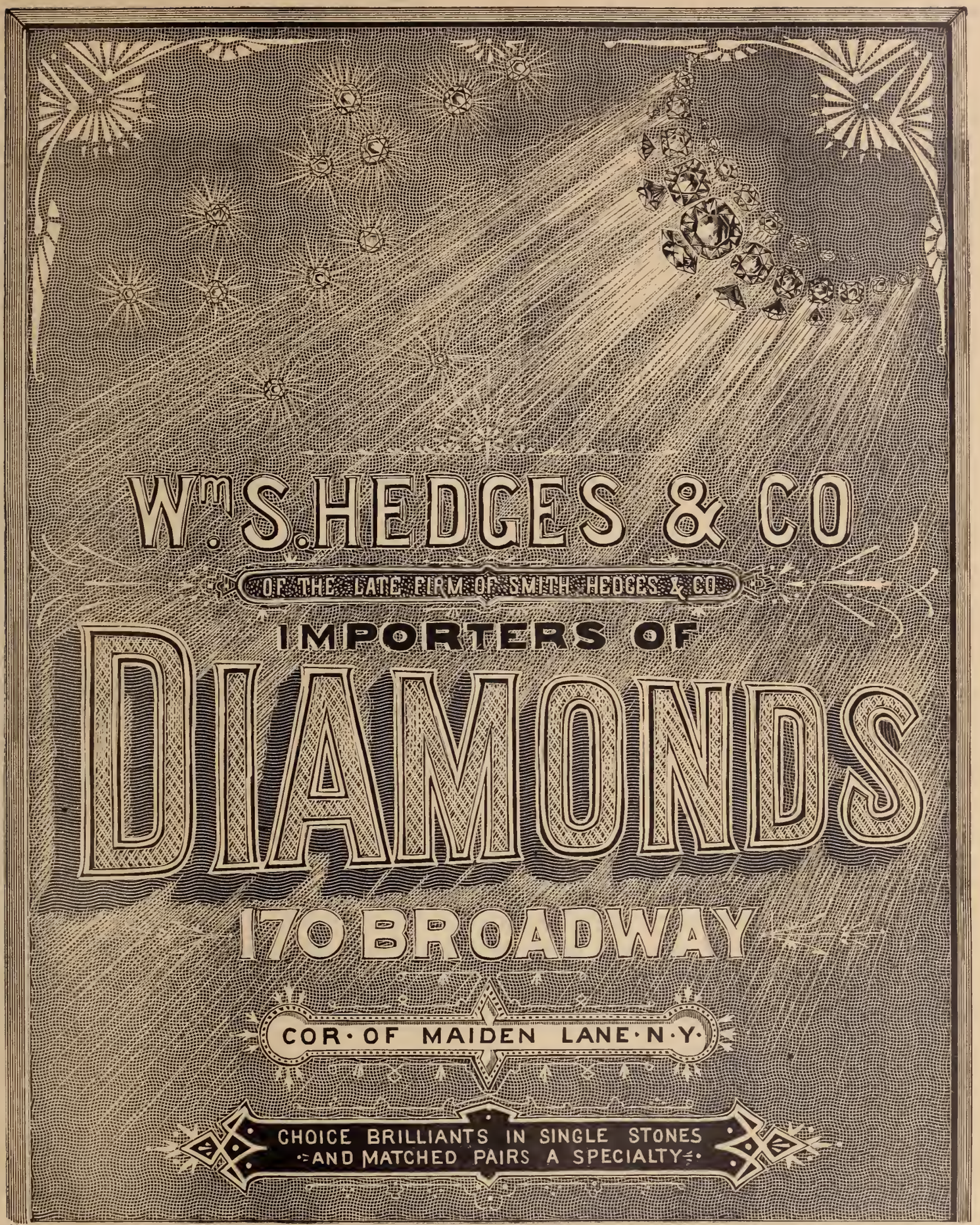
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LOCKETS, CROSSES, SLEEVE BUTTONS & NECKLACES,

RICH SETS IN CORAL, ROSE, STONE CAMEO, INCRUST'ED AMETHYST AND CORAL CAMEO.

Nos. 9 & 11 Maiden Lane,

NEW YORK.



GOODS SENT ON APPROVAL.

To save expense to customers, goods sent and returned by express, are insured at our expense, while in the hands of express companies, therefore value need not be marked on the packages.

WALTHAM WATCHES

ONE MORE STEP AHEAD.

New Model Waltham Watches.

IMPROVED IN APPEARANCE AND QUALITY, BUT NO HIGHER IN PRICE.

The American Watch Co., of Waltham, Mass., is the only American Watch Company awarded the GOLD MEDAL at the PARIS EXPOSITION.

After an experience of many years in selling watches of all grades, from the best makers, we have found none that have given such satisfaction as the "Waltham," and unhesitatingly recommend WALTHAM WATCHES as superior to all others.

Every WALTHAM WATCH sold by us is accompanied by our own guarantee, in addition to that of the American Watch Company.

CAUTION.

It having been demonstrated by frequent assays that many gold and silver cases offered in the market are greatly debased from the quality they assume to be, purchasers of WALTHAM WATCHES, to avoid imposition, should observe that every genuine watch, whether gold or silver, bears the trade mark of the AMERICAN WATCH CO. on both case and movement.

"Eighteen carat" gold, such as WALTHAM cases are made of, is as nearly pure gold as can be made and be durable. It contains 750-1000 of pure gold, and 250-1000 of alloy.

Sterling Silver (English Government Standard) contains 925-1000 of pure silver, and 75-1000 of alloy.

We keep the most complete assortment of these watches constantly on hand, and are prepared to furnish them at the lowest possible cost.

N. MATSON & CO.,
State and Monroe Sts., Chicago.

(From the N. O. Times, Oct. 16th, 1878.)

AMERICAN WALTHAM WATCH AGENCY

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Watches for Ladies, Gentlemen, Mechanics, Laborers and Boys.

RAILROAD WATCHES A SPECIALTY.

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Manufacture five different sizes and 32 distinct grades of Key and Stem-winding Watches, and every watch fully guaranteed. The success of these watches has been remarkable. In 1874 the Company first opened an office in London, England. The first year only 500 were sold; the second year, 1,800; the third year, 5,000, and the last year, 1877, 28,000. These watches are now universally known, and **1,200,000** are speaking for themselves in the pockets of the people. Such is the growth of this Great American Industry. I have sold over **6,000** of these watches in different parts of the South, and as far as I can learn they are all giving satisfaction to-day.

A. M. HILL, Jeweler.

WALTHAM WATCHES.

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That after an experience of forty-six years in selling watches of every grade, from all the best English and Swiss makers, we have never found any to give such perfect satisfaction as the "WALTHAM." BAILEY, BANKS & BIDDLE.

2.

That for accurate time-keeping, durability, and reliability the "WALTHAM" is unequalled.
BAILEY, BANKS & BIDDLE.

3.

Every "WALTHAM" we sell is accompanied by our own guarantee, in addition to that of the American Watch Company.
BAILEY, BANKS & BIDDLE.

4.

We are the leading house in Philadelphia for the sale of these watches. We keep on hand a complete assortment of every grade and variety. As we buy for cash, we can sell at the lowest possible figures.

Bailey, Banks & Biddle,

(Late BAILEY & Co.,)

Cor. of 12th and Chestnut Sts., Philadelphia.

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Waltham Watches!

ENDORSED BY THE LEADING JEWELERS EVERYWHERE.

Theodore B. Starr,

(Of the late firm of STARR & MARCUS,)

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Extending through to No. 1126 Broadway.

By special arrangement with the AMERICAN WATCH COMPANY, *of Waltham, Mass., has opened a Department for the sale of* Watches *of their manufacture, conducted upon such a scale as will present at all times, for the examination of purchasers, a fuller and more representative stock than has been hitherto accessible to the general public.*

M. S. SMITH & CO.

Jewelers,

Watchmakers and Diamond Importers,

COR. WOODWARD & JEFFERSON AVES.,

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These Watches commend themselves to all desiring a reliable time-keeper, the Waltham Company having spent years in bringing their Watches to their present high standard; and we do not hesitate to say that they are the best Watches, for the money they cost, that are manufactured

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WATCHES

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Having had abundant opportunity during a series of years to thoroughly test the merits of these watches, we are prepared to offer them under our own guarantee and to fully indorse their claims for accuracy and reliability.

The marked success which they have commanded in Europe, notably at the Paris Exposition, as well as at our own Centennial, where they have been subjected to competition with the production of the best foreign makers, is a most encouraging and gratifying evidence of the increasing superiority of American manufactures.

We have a full line of all the most desirable movements in stock, and will take pleasure in giving every information that may be desired.

Close prices marked in plain figures.

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NEW MODEL WALTHAM WATCHES.

Improved in Appearance and Quality, but no Higher in Price.

The American Watch Co., of Waltham, Mass., is the only American Watch Company awarded the GOLD MEDAL at the PARIS EXPOSITION.

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Every WALTHAM WATCH sold by us is accompanied by our own guarantee, in addition to that of the American Watch Co.

CAUTION.

It having been demonstrated by frequent assays that many gold and silver cases offered in the market are greatly debased from the quality they assume to be, purchasers of WALTHAM WATCHES, to avoid imposition, should observe that every genuine watch, whether gold or silver, bears the trade-mark of the American Watch Company on both case and movement.

"Eighteen carat" gold, such as WALTHAM cases are made of, is as nearly pure gold as can be made and be durable. It contains 750-1000 of pure gold, and 250-1000 of alloy.

Sterling Silver (English Government Standard) contains 925-1000 of pure silver, and 75-1000 of alloy.

We keep the most complete assortment of these watches constantly on hand, and are prepared to furnish them at the lowest possible cost.

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An improved arrangement for letting down the mainspring without taking off the hands and dial. The barrel can be removed by simply taking off the barrel bridge.

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All the wheels and pinions run in the solid plate in jewels or otherwise, the third bridge being abandoned, so that no part of the train can get out of upright.

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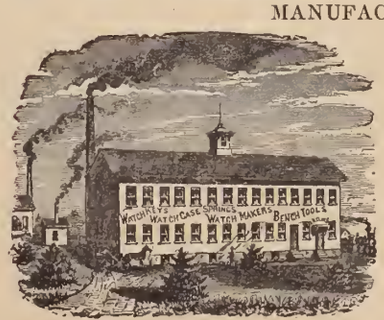
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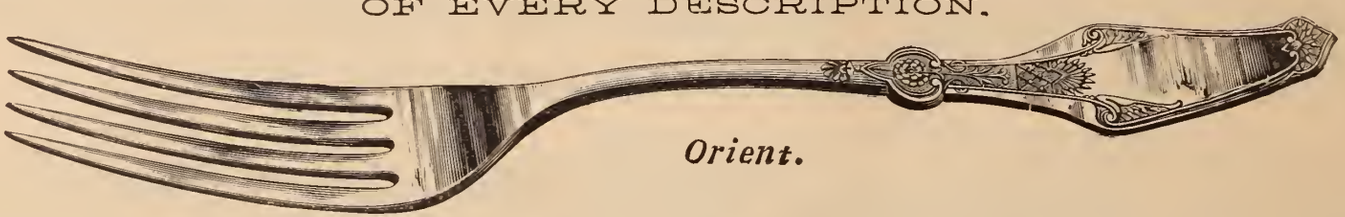
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☞Would call attention of the trade to their new design of fork (illustrated above) which we believe to be the finest design ever manufactured in plate. We are also manufacturing a great number of new designs in all kinds of hollow-ware, and among other things a great number of Fancy Pieces, such as Jewel Boxes, Card Stands, and Case Cologne Sets, etc., which are specially adapted to the holiday trade.

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MINUTE AND SECOND,

MINUTE AND SPLIT SECOND.

Singly and with REPEATERS & CALENDARS.



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Singly, and with

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TO all persons of culture and refinement, who fully appreciate the comfort and convenience derived from the possession of a *fine* watch, the TIFFANY watches commend themselves as accurate and reliable pocket timepieces.

They are constructed upon the latest approved scientific principles, combining simplicity, strength and durability, and are less liable to get out of order than those of more complicated make; the time-keeping qualities are so thoroughly tested and we have such perfect confidence in their accurate performance, that agents are instructed, in our name, to fully guarantee them in *every* particular.

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Manufacturer of Fine Gold Scales,



DIAMOND SCALES,

☞Bullion Balances and Weights, in use at all the U. S. Mints and Assay Offices.

PRICED CATALOGUE ON APPLICATION.

Solid Gold Rings----a Specialty

WM. H. ELY,

Solid Gold Rings

MANUFACTURER.

Viz., Plain, Chased, Engraved, Enameled, Engine Turned, Shield & Scale. *All qualities Warranted*

Orders Promptly Executed.

58 Nassau Street, N. Y.

Vulcanite Jewelry Co.

MANUFACTURERS OF

WHITBY JET,

Combination Whitby Jet and Vulcanite,

Byron's Patent, May 18, 1869,

Also a full line of Lockets—plain, gold mounted and monogram.

No. 191 BROADWAY, N. Y.

☞ Agents for the NEW RUBBER WATCH CASES, Fitting all American Movements.

W. H. LUDEMAN,

Chronometer & Watch MAKER,

Nos. 75 & 77 Nassau Street,

NEW YORK.

☞ Repairing of every Description for the Trade.

FINE WATCHES A SPECIALTY.

To the Trade.—I am now prepared to cut all kinds of Stem-Winding Wheels for the Trade.

F. W. C. Nieberg,

Repairer and Adjuster of

FINE WATCHES

and Marine Chronometers,

No. 8 JOHN STREET

New York.

E. WEISKOPF,

MANUFACTURER OF

Optical Lenses

No. 182 Centre Street, N. Y.

SPECIALTY!

Cylinder and Prismatic Spectacle Glasses, Magic Lantern & Panoramic Lenses.

FINE HAIR WORK

Deutches Geschaft,

The only leading personal Artist in Hair in this country.

WM. ERNEST MOUTOUX,

Factory and Office, 81 Nassau St., N. Y.

Designs of the most complicated description. ☞ Short or Baby Hair made in the finest designs in your presence. Portraits, or copy of noted paintings, made of family hair.

Received one-half column report on my hair work in the New York Trade Journal, of Nov. 9th, 1878. I am the only manufacturer who has Medals and Diploma of Honor on personal fine work in number for inspection.

Lessons given in all branches. Large pattern books for the trade free. Large hair pictures in other books are copyrights from my book and circulated only by my special permit. Prices low on orders from known pattern books.

Gold jewelry and engraving by the best workmen done on the same plan.

JNO. F. LUTHER,

79 NASSAU ST. N.Y.

MANUFACTURER OF FINE PRESENTATION JEWELS FOR ALL SECRET SOCIETIES. KNIGHT TEMPLAR'S CROSSES KEY STONE MARKS SOCIETY SCHOOL AND

College Badges.

CHAS. T. MENGE,

MANUFACTURER OF

Fine Hair Jewelry

And Device Work,

No. 32 John Street, New York.

Pattern books constantly on hand, and will be sent upon receiving satisfactory references.

Patterns from any other books can be ordered from me by giving number of design and name of book.

O. SCHWENCKE,

(Established over 30 years.)

[Successor to G. GUNZENHAUSER],

MANUFACTURER OF

Fine Hair Jewelry,

No. 43 MAIDEN LANE,

New York.

Solid Gold Mountings for Hair Jewelry, kept constantly on hand, and made to order at shortest notice.

Orders from the country trade promptly attended to.

VOSE & SOUTHWICK,

Manufacturers of Gold Jewelry



Sole Makers of the Separable Sleeve and Collar Buttons in Gold.

No. 183 Eddy Street, PROVIDENCE, R. I.

ALBERT FRIEDENTHAL,

Importer and Jobber of

WATCHMAKERS' & JEWELERS'

Materials, Tools and Optical Goods

Real and Imitation Stones,

☞ For Manufacturing and Repairing Purposes

A SPECIALTY.

Agent for TISDALE'S Watch and Clock Oils.

No. 43 Maiden Lane, New York.

Orders by mail will receive prompt attention.



The tool is made of Steel throughout, with the jaws and wearing parts hardened. Every part is made to guage. The finish is first-class and nickel-plated. Warranted to outwear at least three of the imported pin vises.

Offered in two sizes at $18 and $15 per dozen with liberal trade discount. Sold by the jobbing trade generally or by the

LOWELL WRENCH CO., WORCESTER, Mass.

McLane's Anti-Oxidizer.

A Solution for preserving and protecting the polish and color of gold and silver while under process of hard soldering.

The most delicate engraving and chasing is perfectly preserved from tarnishing when treated with this solution, and the article on which it is placed may be heated to a red heat without fear of discoloration. Price, 50 Cents per Bottle.

Sent by Mail, postpaid, on receipt of price.

☞ FOR SALE BY DEALERS IN WATCH MATERIALS.

This Solution is not intended to preserve acid color, but will, in a great measure protect it.

RICHARD OLIVER, 11 John Street, N. Y.

Established 1848. *Reliable and prompt.*

COOPER & BRO.

Wholesale Jewelers,

Importers and dealers in WATCH & CLOCKMAKERS' TOOLS and MATERIALS; also, JEWELERS' SUPPLIES, SPECTACLES, OPTICAL GOODS, &c. A complete Outfitting Establishment for the trade.

Repairs Department established 1865. Every description of work done for the trade. Watch Repairing, Jewelry and Watch Case Repairing, Gold and Silver-Plating, and Fire Gilding.

35 S. Fourth St. (1st floor). PHILADELPHIA



SHUT. OPEN.

CHAS. F. TERHUNE & CO.,

Manufacturers & Jobbers in General Jewelry.

No. 17 Maiden Lane, N. Y.

We beg to call the attention of the trade to the above cuts, representing MISSIMER'S PATENT SHOE, for the repairing of Sleeve Buttons. It is not separable, but works on a simple slide. Recommends itself at sight. Send for sample. A liberal discount to jobbers.

BOURQUIN BROTHERS,

Manufacturers and Importers of Watches,

All Kinds of WATCHES Made To Order

NO. 20 MAIDEN LANE, N. Y.

FACTORY, BIENNE, SWITZERLAND.

DIAMONDS!

Watches, Jewelry, Clocks, &c.

Low Prices—First-class Stock.

No. 77 Fifth Avenue, entire 2d and 3d Floors

PITTSBURGH, PA.

G. B. BARRETT & CO.

WHOLESALE ONLY.

LORIOT & OSTROM

Manufacturers of

Clocks and Fine Movements,

Small Experimental Machinery, Models, Small Driving Machinery, &c.

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Corner Nassau Street, **NEW YORK.**

Fine Lever Movements for Safe Locks a Specialty.

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Die Sinking

Light Machinery and Tools Made to Order.

Also Chasing, Modeling, Designing, and Fine Brass Finishing. Particular attention given to Making and Repairing

Electrical Instruments of all Kinds.

104 BEEKMAN STREET,

Corner Pearl Street, **NEW YORK.**

ABBOTT'S PATENT

XII o'clock Stem-winders

☞Are not made with a "Loose Pinion" to carry the second-hand, but are the regular "full plate" movements made by the several Watch Companies with a peculiar device so attached as to bring the stem opposite the figure XII, instead of the figure III.

☞Messrs. J. T. Scott & Co., No. 11 Maiden Lane, are the sole agents for these watches

HENRY ABBOTT,
Patentee and Manufacturer,
Office, 11 Maiden Lane,
NEW YORK.
Factory, 13 & 15 Franklin Sts., Newark, N. J.

☞Stem-Winding Wheels cut to order.

Established 1850.

Trade  Mark.

PETER L. KRIDER,

MANUFACTURER OF
STERLING
SILVER WARE,

Medal and Diploma Awarded, &c.

Striking Society Medals in Gold, Silver or Bronze
A SPECIALTY!
ARTISAN HALL,
618 Chestnut Street
PHILADELPHIA.

W. F. TREWIN,

Manufacturer of
Watch Cases
—AND—
Jewelry.

☞Prompt and careful attention given to filling orders for all kinds of goods pertaining to the Trade. Goods sent on approval when satisfactory references are furnished.

☞Designs and estimates given, and special attention paid to orders from jewelers for Watches, Badges, &c., designed for presentation.

☞Every description of Watches and Jewelry carefully repaired for the Trade.

730 Chestnut Street, (up stairs),
PHILADELPHIA.

GEO. W. DU BOIS,

(Successor to Albert Landsberg.)



IMPORTER AND MANUFACTURER OF

Optical Goods,

No. 36 MAIDEN LANE,
Near Nassau Street, NEW YORK
Sole Agent for
BLACK'S PATENT
Interchangeable Spectacles,
AND
EYE GLASSES.

Jewelers and others who keep spectacles for sale will please observe that, with these PATENT SPECTACLES, it is only NECESSARY to have a full *Complete Assortment of Lenses and Pebbles*, which being all of a UNIFORM SIZE, will FIT either the Gold, Silver, or Steel Frames, of which but a few of each kind are wanted; an advantage which will give a complete assortment of the finest Spectacles, for one-sixth the capital invested in a like assortment of the same quality goods of the old style frames.

For Particulars, price lists, &c., address

GEO. W. DU BOIS,
New York.

Journal Suisse d'Horlogerie,

A MONTHLY TRADE JOURNAL.

Published in Geneva, under the auspices of the Industrial and Commercial Departments of the Societe des Arts.

Devoted to the interests and for the advancement of Watchmakers and the art of Horology.

This periodical is under the supervision of a body of watchmakers, who have correspondents in the kindred branches of industry and sciences, who contribute the leading articles of interesting subjects and illustrations, publishes the reports of the different commercial and industrial societies, of which it is the organ, and is, owing to its great circulation all over the world, a valuable advertising organ.

☞Subscription, 12 frances a year, (or $2.50). Orders received at the office of The JEWELERS' CIRCULAR.

Allgemeines Journal der Uhrmacherkunst.

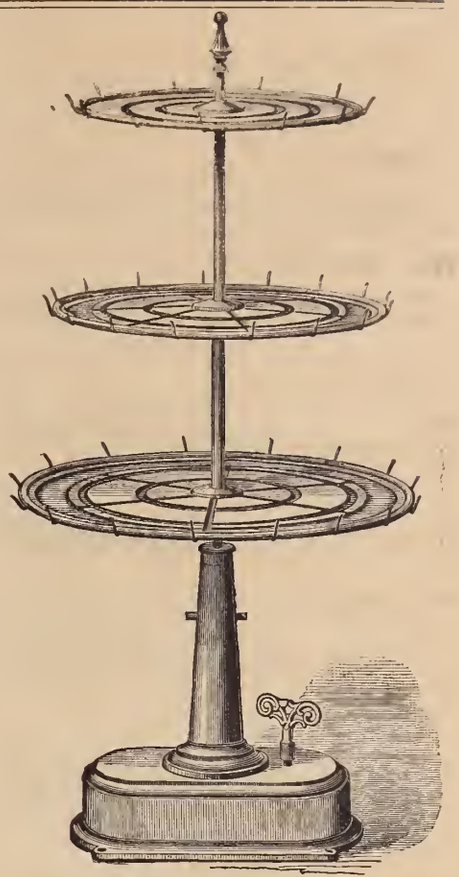
Illustrirte Fachzeitschrift fur Uhrmacher.

Redacteur, Emil Schneider, Uhrmacher in Naumburg, Germany.

Agents for the United States, WM. MUHSAM, 316 W. Pratt St., Baltimore, and O. W. F. BURGER, cor 5th & Olive streets, St. Louis, Mo., who will give every information with regard to subscription and advertisements.

The "Allgemeines Journal der Uhrmacherkunst" has taken upon itself the task of elevating the art of watchmaking, and to protect and further the interests of the trade.

This Journal appears weekly, and, enjoying a great circulation all over the globe, is in a position to offer special advantages for advertisements.



The above illustration represents the Revolving Show Stand for the display of goods in jewelers' windows. As an attractive fixture it has no equal; while in motion it attracts the attention of the passers-by to the goods displayed, showing them from every point of view. The body of the stand is made of iron highly ornamented. The movement is regulated to uniform speed and is constructed for this express purpose. The tables and rod are of ornamental brass, and are detachable, so that one table or three can be used, and can be packed together in small compass for shipping. Height of stand, 40 inches, largest table 16 inches in diameter; 2d, 14 inches; 3d, 12 inches. The brass pins represented are for hanging small articles upon. This machine is complete in all its details, will not get out of order, runs for 6 hours with one winding, is warranted for two years. This machine, gotten up to correspond so thoroughly with the surroundings of a jewelry store, makes it of itself an object of great attraction, and gives thorough publicity to the goods displayed thereon. Shipped by express or freight to all parts of the country. For further particulars address,

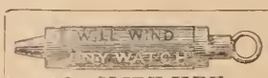
S. B. GUERNSEY,
532 Broadway, New York.



The above engraving gives but a poor idea of the novelty and beauty of these signs. The black dots in the letters represents silver discs which vibrate very rapidly.

Where the purpose is to attract attention nothing that has ever been invented so well answers the purpose, for they never fail to excite the greatest curiosity, and passers cannot avoid reading the sign. In the evening gas light is reflected from them with beneficial effect, and the flashes can be seen for a long distance.

For full particulars and prices, address the manufacturer as above.



10.—SLIDE KEY.
(Nickel Plated.)



11.—SLIDE KEY.
(Nickel Plated, Hexagon Shell.)



12.—POCKET KEY.
(Heavy Rolled Gold Plate Mountings, Plain.)



13.—POCKET KEY.
(Sterling Silver Mountings, Plain.)



14.—POCKET KEY.
(Sterling Silver Mountings, Engine turned.)



15.—POCKET KEY.
(Extra Heavy Rolled Gold Plate Mountings, 18 K., Plain.)



16.—POCKET KEY.
(Extra Heavy Rolled Gold Plate Mountings, 18 K., Engraved.)



17.—POCKET KEY.
(14 Karat, Gold Mountings, Plain.)



18.—POCKET KEY.
(14 Karat, Gold Mountings, Engraved.)

BIRCH'S

Self-Adjusting WATCH KEYS.

WILL WIND ANY WATCH!

FOR SALE BY THE TRADE GENERALLY.



J. S. BIRCH & CO.,

38 Dey Street, New York.

The Burbank Manufacturing Company

Manufacturers of GOLD & SILVER



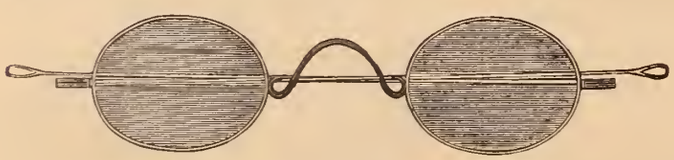
Thimbles,



GOLD
SILVER,
STEEL,
RUBBER,
And SHELL,

EYE GLASS
Self Adjusting.

SPECTACLES AND EYE-GLASSES



OF ALL DESCRIPTIONS.

SOLID GOLD RINGS

Office, 14 MAIDEN LANE, NEW YORK.

Manufactory, Springfield, Mass.

PIVOT DRILLS for WATCHMAKERS.

Every watchmaker knows how difficult it is to make a regular and good, REALLY GOOD, PIVOT DRILL, and what time it takes to grind the drill into the necessary dimensions, this latter manipulation to be perpetually renewed. To avoid this, to save time, to be facilitated in their task, people only need buy our "drill assortment," and they always have a drill ready for use at their disposition. The "drill assortment" consists of 126 different drills, in 12 different numbers (Nos. 1 to 12), every number representing the diameter of the drill by one-tenth of a millimeter, thus: No. 3 being 3-10 of a millimeter. The numbers run by ½ tenth of a millimeter, beginning from 1-10 of a millimeter, and proceeding as far as 2-10 millimeters, equal to No. 12. These drills are made of the best quality of steel, perfectly hardened for all metals, and ready for use. They are accompanied by two drill stocks, corresponding to the two strengths of steel the drills are made of—the small drill stock serving for the lower numbers, the large one for the higher numbers of drills.

Now, when a workman wants to bore a hole, all that is required to do is to choose the necessary number of drill and put it into the drill stock. The utility and convenience of these drills must be appreciated by every watchmaker.—FROM THE PROCEEDINGS OF THE HOROLOGICAL CLUB, FEB., 1878.

☞ Since the above views of the Club appeared, we have had orders for several sets, and they have given the greatest satisfaction. They will be forwarded by mail, post-paid, to any address, on receipt of $3.00, at the office of the JEWELERS' CIRCULAR, 42 Nassau St., N. Y.

Established 1850.

The only establishment in the United States that is devoted exclusively to the sale of Musical Boxes.

M. J. PAILLARD & CO.,

MANUFACTURERS, IMPORTERS & DEALERS IN

Musical Boxes

Suitable for the requirements of all classes, offer their entire stock at prices that will command the attention of buyers.

THE Musical Boxes made by us, have achieved a world-wide reputation, and it is safe to say that two-thirds of the improvements in Musical Boxes have originated in our establishment. The patents of which are owned exclusively by us.

Our stock is unusually complete and attractive and embraces many novelties, among which we may mention, the Sublime Harmony, the Harp Piccolo, and several others.

The double mainspring introduced by us is also a decided improvement, as it obviates the necessity of frequent winding. The greatest novelty in Musical Boxes is the interchangeable system of cylinders. These boxes are desirable goods for dealers as the cylinder can be increased to any extent and a single instrument made to play an infinite variety of music. These cylinders can be ordered at pleasure, and all that is necessary to insure them fitting is to give the number of the box.

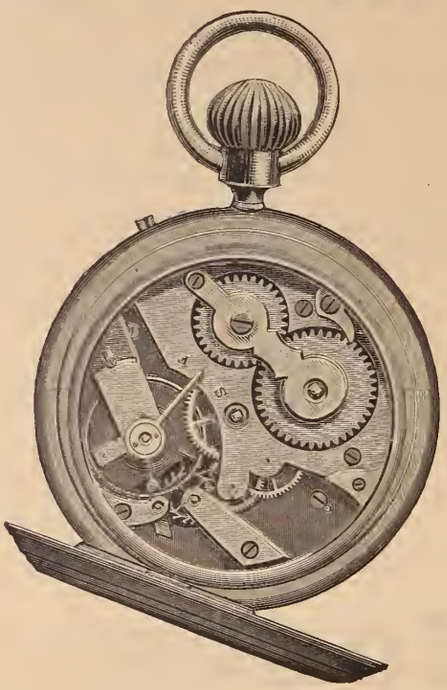
SPECIALTIES FOR THE HOLIDAYS!

Have just received an invoice of Musical Albums, Chairs, and other musical novelties and fancy articles, appropriate offerings for the holidays.

M. J. PAILLARD & CO.

No. 680 BROADWAY, NEW YORK.

The Pioneer Watch.



HENRY GINNEL, Sole Manufacturer,

No. 31 Maiden Lane, NEW YORK.

P. O. Box 2967.

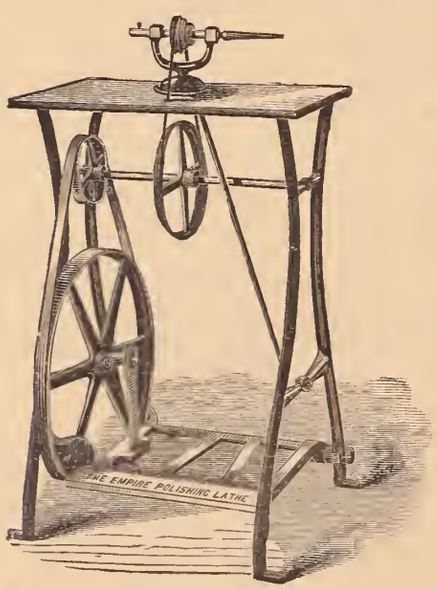
☞The accompanying illustration is a fac-simile of the Pioneer Watch. The Best (stem-winding and stem-setting) Pocket Timekeeper ever offered to the trade. They are cased in silver and German silver—Hunting and Open Face.

FRASSE & COMPANY,

IMPORTERS OF

Tools, Files and Supplies

FOR WATCHMAKERS, JEWELERS, DIE-SINKERS, ENGRAVERS, MACHINISTS, &c.



THE EMPIRE Polishing Lathe.

This Lathe combines great speed with power. The former is obtained by means of the countershaft and the latter by the large heavy driving wheel.

☞Parties desiring any particular style of head can have the same by so ordering.

Those who desire a first-class article would do well to examine this machine before purchasing any other. **Price $25.00**

No. 62 Chatham Street, New York.

Established 1816. P. O. Box 4627.



GEO. W. SIMONS, JOHN F. SIMONS, PETER B. SIMONS, GEO. W. SIMONS, Jr. JOHN SPEICKER, FRED. M. SIMONS.

SIMONS' BROTHERS & CO.

MANUFACTURERS OF

Gold Chain and Jewelry,

611 & 613 Sansom Street,

PHILADELPHIA.

Awarded Medal and Diploma at the Centennial.

Simons' Brothers & Co.

611 & 613 Sansom Street, Philadelphia.

NE PLUS ULTRA.

Williams & Cook's Dust-Proof Watch Keys,

Patented Sept. 1st, 1874.



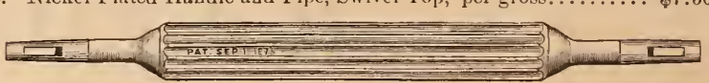
A C A

The Popular Name Key.

A. Nickel Plated Handle and Pipe, Swivel Top, per gross..... $10.75

English Pattern Key.

C. Nickel Plated Handle and Pipe, Swivel Top, per gross..... $7.50



BENCH KEYS.

Corrugated Gilt Handles, Tempered Steel Pipes, per Set of Six.....$1.80
" " " " " " per Set of Three..... .90

P. Style of Key.

Gilt Handle. Steel Pipe.
Per Gross.....$8.50



Our Key Pipes are all warranted to be made of the finest quality of steel. One great advantage his key has over all others, is the mortice through the pipe, making it the most simple and horoughly dust and moisture-proof, as well as the cheapest key in the market. Our sizes run rom 1 to 12; 4, 5 and 6 fit Gents' American Watches; No. 8, Ladics' American.

☞For sale by the Trade generally.

KENDRICK, DAVIS & CO., LEBANON, N. H.

SOLE OWNERS AND MANUFACTURERS.

☞ The advantage of our Name Key, as an advertising medium, will at once be seen.

SPECIAL NOTICES.

FOR SALE.—Very low; the entire machinery and tools for manufacturers of full plate watches. Address, P. O. Box 3100, N. Y.

WANTED—A regulator movement, second-hand or new—one made for an astronomical clock preferred Address, 42 Nassau street, N. Y.

JOSEPH HOEY & CO., No. 658 Broadway, New York, Photo-Wood Engravers,—each article engraved immediately from the photograph. The best and only reliable method.

WANTED—Situation by a young man, 20 years old, who has worked one year at the trade and wishes to finish—wages no object Address, W. G. Smith, Youngstown, Ohio.

FOR TRADE—160 acres good land, 40 acres under cultivation, fine sugar orchard and 150 fine poplar trees, good title, for watches and jewelry. Address, Jeweler, Box 50, Bedford, Ind. Value of land, $20 per acre.

WANTED—A situation by an experienced watchmaker who has had practical experience in adjusting and rating fine watches. High wages not so much an object as a permanent situation. Can furnish good references. Has good tools, Will go on trial, if necessary. Address, F. M. R., P. O. Box 51, DeRuyter, Madison Co. N, Y.

TO LET—In Great Jones street, one door from Broadway, a large store 28x140, also lofts same size; will be arranged to suit tenants, steam power and steam heating; rent low. This is without doubt the most desirable location uptown for manufacturing jewelers. For terms, etc., apply to E. A. Lanten, 53 Prince street, N. Y.

FOR SALE—A book on "The Watch," 3d edition. Hand work vs. Machinery, etc.; History of Watchmaking by Both Systems, by Henry F. Piaget, watchmaker. Price 25 cents. Post paid to any address on receipt of price by the author, Henry F. Piaget, 36 Maiden Lane, N. Y., or at the office of this Journal.

WANTED—A situation, by a watchmaker of fifteen years experience, both in Switzerland and the United States, to take charge of the watch repairing department of a first class jewelry store. Northern or Western States preferred. If necessary will go on trial. References furnished. Address E. B , care T. Beguelin. 71 Nassau St. N.Y.

FOR SALE—One of the finest Jewelry stands in Illinois; population about 5000. Stock and fixtures about $3000 together with a dwelling-house costing $1800. Fine storeroom with Herring vault and 5ft. safe; or will rent storeroom low. Business established nine years, books of work and sales open to inspection Address Joseph Becker, care of Duhme & Co., Cincinnati, O.

GEO. E. WILKINS.—Importer of fine Tools for Watchmakers, cutting and dividing engines, rounding-up tools and cutters, also cutters for stem-winding wheels. Fine lathes with the American system of chucks. Dividing engine and rounding up tool combined. Marine chronometers for sale. Special tools imported to order.
21 South Salina St., Syracuse, N. Y.

HENRY F. PIAGET, Manufacturer, Examiner and Repairer of every description of fine stem and key winding watches. No. 36 Maiden Lane, N. Y. Pivots and jewels of any kind inserted, New pieces of every description made and fitted. Examining, repairing and cleaning done in the best manner. Send for price list of repairs on new pieces, etc. Estimates given, when required, before doing the work.

FOR SALE—A rare chance for a watchmaker and jeweler wishing to come South. A small jewelry store in the thriving and healthy town of Newnan, Ga. Population over 3000. Business well established, no opposition to speak of. Rent very low. Will sell part or the whole of stock—show cases, etc. or will sell nothing, but turn over my trade to any good business man for $250. For further information address J. W. McMillian, Newnan, Ga.

BUSINESS NOTICES.

We take great pleasure in calling the attention of the trade to the revolving show stand, offered by Mr. S. B. Guernsey, and illustrated in his advertisement elsewhere in the CIRCULAR. This show stand is one of the most attractive fixtures for the display of goods in watchmaker's and jeweler's windows we have ever seen, and is just the thing for every enterprising jeweler to have, for it is not only a elegant and attractive show stand, but a perpetual and conspicuous advertisement, that will arrest the attention of every passer-by.

New and novel designs in pencil-casess and penholders are offered to the trade by the old established house of Edward Todd & Co., of 652 Broadway, New York. The magic pencil is intended for a watch-chain ornament, is of heavy gold, handsomely engraved, and can be extended to a convenient length to write with. There are others of agate, onyx, jaspar, bloodstone, etc., having gold mountings set in pearl and diamonds. The largest stock of real pearl penholders in the market can be found here, ranging from low to very high prices. The patent paragon case has both pen and pencil, and is made to carry in the pocket. The India rubber pen is of gold, covered with rubber, which gives it the quill elasticity. There are many other new features in the stock shown by this house that will be appreciated by the trade when seen

Buyer's Directory.

A Guide to the prominent Wholesale Houses in the Watch, Clock, Jewelry and kindred branches of Trade in New York, Philadelphia, Chicago, Providence and Newark.

NEW YORK.

Bohemian Garnet Jewelry.

Bissinger, Philip—Importer of Diamonds, Pearls and Precious Stones. Sole Agent for the Bohemian Garnet Jewelry, 22 John St.

Clock Companies.

Seth Thomas Clock Co. Manufacturers of Clocks of all kinds. Salesroom, No. 581 Broadway,

Ansonia Clock Company.—Nos. 19 & 21 Cliff street, and 5 Cortlandt street, N, Y.

Waterbury Clock Co.—M. Bailey, Treasurer, Manufs. and Jobbers, No. 4 Cortlandt Street, N. Y., and No. 197 State Street, Chicago.

Corals and Coral Jewelry.

Errico Bros.—Importers of Coral, Conch-Shell and Silver Filigree Jewelry, etc., 19 John St.

Granberry, T.—Specialty, Coral repairing for the trade, at reduced prices. Manufacturer of Coral and Black Onyx Jewelry. No. 51 Nassau street.

Squadrilli, Ach.—Manufacturer and Importer of Coral, Conch Shell and Silver Filigree, etc No. 9 Maiden Lane, N. Y.

Cameo Cutters, Etc.

Bonet, L.—(Successor to Bernerd & Bonet), Cameo Likenesses, 889 Broadway, N. Y.

Habermeier & Wiederer—Engravers of Cameo Likenesses, Seal Stones. Cameos repaired. 23 John St.

Zwetsch, L.—Cameo Engraver. Likenesses cut from Photographs. No. 42 John street.

Charms & Gold Watch Keys.

Rupp & Held,—Manufacturing Jewelers, Charms and Gold Watch Keys, with French and English Ratchets, a specialty. 15 John st., N.Y.

Cutlery.

Harrison Bros. & Howson,—Manufacturers of Fine Ivory and Pearl Table and Pocket Cutlery; Carvers in Cases; Nutpicks, Nutcracks and goods suitable for the jewelry trade. 26 Cliff street. W. C. Burkinshaw, Sole Agt.

Diamonds.

Anderson, Otis,—Diamond Broker and Commission Merchant. No. 9 Maiden Lane.

Bernhard, A. & Co.—Manufacturing Jeweler & Importers of Diamonds and Precious Stones, also Diamond Mountings, No. 169 Broadway, Gilsey building.

Bissinger, E.—Importer of Diamonds, No. 192 Broadway. New York.

Bissinger, Philip—Importer of Diamonds, Pearls and Precious Stones. Agent for the Bohemian Garnet Goods No 22 John St., N.Y.

Buckenham, Cole & Saunders—Importers of Diamonds and other Precious Stones, No. 10 Maiden Lane, N. Y.

Fera, Henry—Importer of Diamonds, and Manufacturer of Fine Diamond Jewelry. No. 9 Maiden Lane, New York. Amsterdam, Holland, 23 Loojersgracht.

Herbert, R. J.—Importer and Broker in Diamonds, 24 John Street.

Hedges, Wm. S. & Co.—Importers of Diamonds. No. 170 Broadway.

Morch, Jacob—Importer of Diamonds, Pearls, French & Italian Stone Cameos, Amethysts, Onyxes, and Precious Stones. Diamonds in pairs a specialty. No. 25 Maiden Lane, N. Y.

Neresheimer, E. Aug.—Importer of Fine Diamonds. No. 21 Maiden Lane, New York.

Smith, Alfred H. & Co.—Importers of Diamonds No. 14 John Street.

Diamond Cutters.

The Morse Diamond Cutting Co. of Boston.—Henry D. Morse, General Manager. N. Y. Office, 192 Broadway, corner John street. J D. Yerrington, Agent.

Diamonds and Diamond Jewelry.

Bissinger, Philip.—Importer of Diamonds, 22 John street, N. Y. Agent for the Bohemian Garnet Goods.

Bornemann, Louis—Manufacturer of Diamond Jewelry from original designs, 169 and 171 Broadway.

Heller & Bardel—Manufacturers of Diamond Jewelry, and Dealers in Diamonds, No. 13 John street.

Taylor & Brother—Importers of Diamonds and Diamond Jewelry, 676 Broadway.

Diamond Setters, Etc.

Asher, J.—Jeweler and Diamond Setter, Precious Stones Inlaid and Incrusted with Diamonds, Nos 880 and 882 Broadway.

Wood, Chas. F.—Engraver and Incruster of Precious Stones and Diamond Setter. No. 169 & 171 Broadway.

Blancard & Oberlander—Manufacturers of all kinds of Settings and Galleries of any carat of Gold, Silver, Platinum and Platinum Lined. Send for sample cards. 36 and 38 John street, N. Y.

Friend, S.—Manufacturer of Fine Jewelry, and Diamond Setter. 33 John street, N. Y.

Dials, &c.

Caesar Brothers—Manufacturers of Enameled Clock Meter and Gauge Dials, Patent Door, Coffin and Pew Plates, Druggists' Labels, &c. No. 32 and 34 John Street.

Gold, John T.—(Successor to the late T. Gold), Enamel Watch Dial Maker, 81 Nassau St.

Enamelers, Etc.

Nutt, J. D.—Enameler on Gold, Silver and Copper, 32 and 34 John St. Birds, Flowers, etc., Enameled in colors.

Orr, Jas. C.—Enameler on Fine Jewelry, Flowers, Birds, &c., Enameled in colors. Band Bracelets (a specialty). 77 Nassau Street.

Electroplaters, &c.

Jeandheur, F. & Son,—Gold and Silver Electro Platers & Fire Gilders, coloring Etruscan and Gold Jewelry a specialty. 117 Fulton St.

Engravers and Die Sinkers

Fackner, Edward—Carver, Engraver and Chaser on Jewelry and Pencil Cases. Monograms Lettering, &c. 19 John Street.

Knapp, Charles—Engraver, Die Sinker & Manufacturer of Band Rings. 14 and 18 kt. Shanks and Heads for Rings, &c., 41 Maiden Lane.

Schuller, J. Dan'l—Stone Seal Engraver, Arms Crests, Initials and Monograms engraved on Stone Seals, &c. 71 Nassau street.

Fancy Goods, Clocks, Bronzes, Etc.

Hinrichs, C. F. A.—Importer and Dealer in French, English and German Fancy Goods, etc., etc. 29, 31 & 33 Park Place, N. Y.

Magnin, Ve J. Guedin & Co.—Importers of Clocks Bronzes, Musical Boxes & Rich Fancy Goods etc., 652 Broadway.

Le Boutillier & Co.—Importers of Fancy Goods, Clocks, Bronzes, &c. 3 Union Square

Gold Chains, Etc.

Beck, J. & Son, Manufacturers of Fine Gold Chains and Chain Bracelets, 10 Liberty place, near Maiden lane, N. Y.

Dorrance, Edge & Co.—Manufacturers of the Celebrated Woven Fabric Gold Chain, No. 9 John street.

Hamiltons & Hunt.—Manufacturers of Fine Plated Chains and Patent Buckle Bracelets. Branch office, 176 Broadway. Factory, 226 Eddy street, Providence.

Kaufmann Bros.—Manufacturers of Gold Chains and Chain Bracelets, 26 John street; Factory 331 and 333 Bowery, N. Y.

Nord & Schlag,—Manufacturers of Gold Chain. No. 366 Broome St., N. Y.

Saxton, Smith & Co.—Manufacturers of Fine Gold Chain. 194 Broadway.

Gold Pens, Etc.

Aikin, Lambert & Co.—Manufacturers of Choice Gold Pens, Cases, Holders, Toothpicks, etc., 12 Maiden Lane, N. Y.

Mabie, Todd & Bard—Manufacturers of Gold Pens, 180 Broadway.

Todd, Edward & Co.—Manufacturers of Gold Pens, Pencil Cases, Tooth Picks, &c., 652 Broadway, N. Y. Factory, Brooklyn.

Goldsmiths, &c.

Greene, Wm. C. & Co.—Goldsmiths; Manufacturers of Rich Sets in Taper Wire Coral. Office, 18 John street.

Gold Rings.

Bowden, J. B. & Co.,—Manufacturing Jeweler.—Solid Gold Rings a specialty, 11 Maiden Lane.

Ely, W. H.—Manufacturer of Solid Gold Rings of every description. No. 58 Nassau Street.

Peckham, Wm. H. & Co.—Manufacturers of Solid Gold seamless Rings and Fancy Embossed Rings, Patent Spectacles, Jewelry, etc., No. 4 Liberty Place.

Hair Jewelry.

Bernhard, A. & Co.,—Manufacturers of Fine Hair Jewelry and Device Work. The latest styles. 169 Broadway, Room 3, New York.

Menge, Chas. T.—Manufacturer of Fine Hair Jewelry and Device Work. No. 32 John St.

Sauter, L.—Manufacturer of Fine Gold and Hair-Jewelry and Device Work. Nos. 65 & 67 Nassau Street.

Schwencke O.—Manufacturer of Fine Hair Jewelry. Orders from the country promptly attended to. No. 43 Maiden Lane.

Jewelry Cases, Fancy Boxes, Etc

Braun, Chr. E.—Manufacturer of Jewelry Boxes, Trays for Show Cases, &c., 62 Chatham stt.

Wiggers & Froelick—No. 60 Nassau street.—Manufacturers of Cases for Jewelry, &c., of every description. Trays for Show-cases, Stands for Show-windows, etc. Jewelers' Traveling Cases, light, convenient and strong.

Jackson, Samuel C.—Manufacturer of Box and Trays, for Silverware, Watches, Jewelr &c. 180 Broadway, N. Y.

Sturn, L—Manufacturer and Importer of Cases for Jewelry, Watches, Silverware, &c. No. 15 John street, N. Y.

Welch & Miller—Manufacturers of Morocco, Velvet, and Satin Jewelry Cases, Trays, &c. Complete stock on hand. 169 Broadway.

Jewelry—Fine.

Aikin, Lambert & Co.—Manufacturers. General stock of Reliable Jewelry, 12 Maiden Lane.

Alford, C. G. & Co., Manufacturers. General line fine and reliable goods. Specialties in Onyx goods and chain. 183 Broadway, New York.

Andrews, J. F—Manufacturer of Fine Jewelry, Lockets, Sleeve Buttons and Rings in Stone Cameo, etc., a specialty. 35 Maiden Lane.

Baldwin, Sexton & Peterson,—Manufacturers Fine Jewelry. Whiting Building, Broadway and Fourth street.

Ball, Wm. H. Manufacturing Jeweler. Fine Gold Bracclets a Specialty. No. 9 John St., N.Y.

Barthman & Straat—Manufacturers of Fine Jewelry. Seal and Stone Rings a Specialty Orders promptly attended to. 41 Maiden L

Bergstein & Son,—Manufacturing Jewelers, No. 20 John Street.

Bissinger, E. — Importer of Fine Jewelry, Lockets, Crosses, Neck Chains, &c., No. 192 Broadway.

Brown, Thos. G.—Manufacturer of Rich Jewelry Necklaces, Lockets, Bracelets, Sleeve Buttons, etc., 9 Bond street, N. Y.

Brainerd & Steele — Successors to Brainerd, Steele & Co., Manufacturers of Fine Jewelry and Brainerd's Patent Lockets. No. 9 Maiden Lane, New York.

Burch, Geo. & Co.—(Successors to Burch, De Mott & Coughlin,) Manufacturing Jewelers, 17 Maiden Lane, N.Y. Factory, Newark, N.J.

Carrow, Crothers & Co.—Manufacturers of Fine Jewelry, Roman Band Bracelets, Lockets, Crosses, &c. 12 John Street, N. Y.

Carter, Howkins & Sloan.—Manufacturing Jewelers, Whiting Building, 4th St. & Broadway

Chatellier & Spence,—Manufacturing Jewelers. No. 652 Broadway, N. Y.

Coe, Pinneo & Stevens.--Manufacturers of Fine Jewelry, Fine Gold Lockets and Linen Finished White Enameled Goods a Specialty, No. 9 Maiden Lane, N. Y.

Chatterton & Dodd—Manufacturers of Fine Gold Jewelry, No. 19 John street, N. Y.

Demmert Bros.—Manufacturers and Importers of Fine Jewelry, Cameo and Onyx Lockets, Sleeve Buttons and Sets a specialty. Old No. 9 Maiden Lane, New York.

Downey & Smith,—Manufacturers of Fine Jewelry. No. 24 John Street.

Field & Co.—Manufacturing Jewelers, 8 Maiden Lane, N. Y.

Frankel & Folkart,—Manufacturing of Seal, Cameo and Amethyst Rings, a Specialty. Ladies' and Gents' Lockets, Cameo Sets, &c. Also a full line of Diamond Settings, 192 Broadway, cor. John street, N. Y.

Goddard, John M.—Manufacturing Jeweler,—Seal Rings and Fine Lockets a specialty, No. 25 Maiden Lane, N. Y.

Goldsmith & Schliesser,—Manufacturing Jewelers and Importers of Diamonds and Watches. No 5 Maiden Lane.

Greason, Bogart & Pierce, successors to Arthur, Rumrill & Co., 182 Broadway, manufacturers of fine jewelry and gold chains

Griffith, H.—Manufacturer of Fine Jewelry. Studs a Specialty. Nutry Alley, Adams near Concord St., Brooklyn.

Hartmann, P.—Manufacturer & Importer of Fine Gold, Diamond, and Filagree Silver Jewelry, No. 36 Maiden Lane. P. O. Box 2,454.

Haskell, H. C.—Manufacturing Jeweler. Seal Rings a specialty. Special attention to Jobbing of every description. 12 John street.

Hunt & Owen.—Manufacturing Jewelers. Office, 5 Maiden Lane.

Hale & Mulford,—Manufacturers Rich Jewelry, Whiting Building, Broadway and 4th Street.

Jeanne Brothers.—Manufacturers of Diamond Mountings & Rich Jewelry. 1 Maiden Lane.

Keller, Chas. & Co.—Manufacturing Jewelers Lockets a Specialty. No. 13 John St., N.Y.

Krementz & Co.—Manufacturing Jewelers, No. 13 John Street, N. J.

Kroll, H.—Manufacturer of Fine Jewelry. Repairing (a specialty) done for the trade at moderate prices, 78 Nassau street.

Kuhn & Doerflinger—Manufacturers of Enamel'd and Roman Band Bracelets, also Fine Lockets and Pendants, 18John street.

Lennon, John D.—Manufacturing Jeweler, 142 Fulton street. Flat, and Half-round Gold Bracelets, Roman and Stone Lockets.

Moore & Horton.—11 Maiden Lane, Manufacturing Jewelers, Rings, Studs, Collar and Sleeve Buttons, Pins, Ear-rings, &c.

Mitchell, Noah.—Manufacturer of Fine Gold Jewelry, 694 and 696 Broadway, N. Y.

Miller Bros.—Manufacturers of Fine Jewelry Lockets, Sleeve Buttons, Studs, etc., etc. 11 Maiden Lane, New York.

Mulford & Bonnet—Manufacturing Jewelers and Jobbers, 21 & 23 Maiden Lane, N. Y. Particular attention given to Jobbing and Special orders.

Maass, Cook & Groeschel—Manufacturers of Fine Jewelry and Lockets, 191 Broadway, (over Mercantile Bank,) N. Y.

Marx Kossuth & Co.—Manufacturing Jewelers. 39 Maiden Lane.

Owen, G. & S. & Co.—Manufacturing Jewelers. Office, No. 5 Maiden Lane.

Riker, William—Manufacturer of Jewelry. Inlaid Gold Jewelry a Specialty. No. 5 Maiden Lane, N. Y.

Riley, J. A. & Co.—Manufacturing Jewelers, Etruscan Gold and Coral Sets, Roman Bracelets, Necklaces, etc. Onyx Goods a specialty. 7 and 9 Bond street. New York.

Richardson, Enos & Co.—Manufacturers of Fine Gold Jewelry, Gold Chains, Lockets, Crosses and Necklaces. Colored and Etruscan Work. No. 23 Maiden Lane, New York.

Richardson, J. W. & Co.—Manufacturers of Jewelry, Masonic and other emblems. 196 Broadway, Manufactory, Providence, R.I.

Sexton & Cole—Manufacturing Jewelers, Colored Gold and Onyx Goods a specialty. No. 30 Maiden Lane.

Shoemaker & Co.—Manufacturing Jewelers, Cameo Buttons, and Lockets, Roman Gold Goods, etc. No. 21 Maiden Lane, N. Y.

Stites, E.—Manufacturer of Fine Jewelry. No. 12 Maiden Lane, N. Y.

Sturdy Bros. & Co.—Manufacturers of Jewelry, No. 14 Maiden Lane, New York.

Thoma, Ernest—Manufacturer of Fine Jewelry. Sleeve Buttons, Rings, Ear-rings, &c. No. 173 Broadway, N. Y. Factory, Hackensack, N. J.

Trier Bros. & Co.—Jewelry. Optical, Rubber, Jet, Shell, Ivory, Amber and Pearl Goods. Silk Guards, Japanese Bamboo Watch Chains a Specialty. No. 15 Maiden Lane.

Vulcanite Jewelry Co.—Manufacturers of Whitby Jet and Vulcanite Jewelry, 191 Broadway, N. Y.

Wadsworth, E. E.,—Manufacturer of Rich Jewelry and fine Rolled Plate. Fine Seal Rings a specialty. 35 Maiden Lane.

Wheeler, Parsons & Hays.—Manufacturers of Fine Jewelry, Watch Cases, Gold Chains, &c and Dealer in American and Swiss Watches, No. 2 Maiden Lane, N. Y.

Wienhold, Joseph—Manufacturer of Fine Jewelry and Diamond Setter. 24 John St.

Woglom & Miller —Manufacturing Jewelers, Nos. 32 & 34 John street, N. Y. Specialty, Black Onyx goods.

Jewelry Glasses.

Brown, Edwin — Lapidary. Manufacturer of Glasses, for all kinds of Jewelry, Clocks, Chronometers, &c. Glasses bent to any shape. No. 85 Nassau st.

Jewelers' Boxes.

Dennison Mfg. Co.—Manufacturers of Jewelers Findings, Paper Boxes, Cards, Tags, Cottons, Tissue Papers, &c., 198 Broadway, N. Y.

Dahlem, W.--Manufacturer of Cases for Jewelry and Silverware, No. 85 Nassau Street, N. Y Show Case Trays, &c., at the shortest notice

Frasse & Co.—Importers of Stubs, French, Swiss. German and Sheffield Tools, Files and Steel Wire for Watchmakers, Jewelers, etc., 62 Chatham street, N. Y.

Hammel, L. & Co.—Importers of Materials and Tools for Watchmakers, Jewelers and Engravers—also Optical Goods, &c., 9 Maiden Lane, N. Y.

Zimmern, Henry—Importer of Watch Materials, Tools, Glasses, Silk Guards, Silver & Plated Chains, Optical & Fancy Goods, 8 Maiden L

Lapidaries.

Kordmann & Michel—Lapidaries, dealers in Precious Stones. Rubies, Sapphires and Peridots cut. No. 32 Maiden Lane.

Musical Boxes.

Paillard, M. J. & Co—Importers & Manufacturers of Musical Boxes, No. 680 Broadway, N. Y.

Opticians.

Burbank Manf'g Co.—Manufacturers of Spectacles and Eye Glasses of all descriptions, in gold, silver, etc., 14 Maiden Lane, N. Y.

Du Bois, Geo. W.—Successor to A. Landsberg, Importer and Manufacturer of Optical Goods 36 Maiden Lane, Box 3993, N. Y.

Hammel, L. & Co.—Importers of Spectacles, Opera and Marine Glasses, Telescopes, Microscopes, Optical & Fancy Goods, 9 Maiden L.

Laurencott, J. B.—Importer of Watch Glasses, Optical and Fancy Goods, Clocks, Bronzes, etc., 33 Maiden Lane, N. Y.

Lorsch, Albert—Manufacturer of the Patent Accommodating Spectacles and Eye Glasses in Gold, Silver and Steel, and other Optical Goods, 37 Maiden Lane, N. Y.

Serin, A.—Manufacturer of Spectacles and Eye-Glasses, in Steel, Shell and Rubber. Repairing of all kinds. Opera Glasses covered and re-gilt, etc. 169 and 170 Broadway.

Spencer Optical Manufacturing Co.—Gold, Silver, Steel and Nickel Plated Spectacles, Eye Glasses, &c. 13 Maiden Lane, N. Y.

Suttie, Wm. J.—Manufacturer of Eye Glasses and Spectacles, in gold, silver, steel and shell, (Price List by mail), 39 Maiden Lane.

Precious Stones, &c.

Bissinger, Philip—Importer of Diamonds, Pearls and Precious Stones. Agent for the Bohemian Garnet Goods. No. 22 John St., N. Y.

Gruet, Jules.—Importer of Precious and Imitation Stones, Amethysts, Topazes, Cameos, Garnets, Doublets, Imitation Diamonds, Pastes, etc., No. 14 John street. Manufactory at Septmoncel, France.

Meyer, Francis Ed. —Successors to John B. Behrmann, Importer of Imitation Precious Stones, all sizes and shapes constantly on hand. No 38 Dey street, P.O. Box, 1981.

Rings and Shanks.

Bryant & Bentley. Manufacturing Jewelers, 350 Patterns Hard Solder Rings, 12 Maiden Lane

Knapp, C.—Manufacturer of Band Rings of 14 and 18karat, Gold Shanks & Heads for Rings. 41 Maiden Lane.

Silverware.

Gorham Manufacturing Co.—Union Square.

Whiting Manufacturing Co.—Manufacturers os Sterling Silverware, cor. Broadway & 4th st.

Wood & Hughes.—Manufacturers of Fine Silver ware. 14 John Street, N. Y.

The Adams & Shaw Co.—Manufacturers of Silverware. Cor. Broadway & 4th St., N. Y.

Silver Plated Ware.

Hall, Elton & Co.,—Manufacturers of the Finest Electro-Plated Ware, salesroom, 75 Chambers street, N. Y.

Holmes, Booth & Haydens—Manufacturers of Silver-plated Ware. 47 Chambers street.

The Adams & Shaw Co.,—Silversmiths, Whiting Building, cor. Broadway & 4th street, N. Y.

Meriden Britannia Co—Manufacturers of Silver plated Ware, Union Square, N. Y.

Middletown Plate Co.—Manufacturers of Superior Electro-Plate. Factories, Middetown, Conn., Salesroom. 13 John Street

Manhattan Silver Plate Company.—Manufacturhrs of every description and quality of Silver Plated and Bronze Ware, office No. 952 Broadway. Factory 382 to 390 2d Ave.

Reed & Barton—Manufacturers of Fine Plated and Table Ware, of every description, 686 Broadway, N. Y.

Rogers & Bro. — Manufacturers of the finest quality of Electro-Plated Ware. 690 B'way.

Simpson, Hall, Miller & Co.—Manufacturers of Fine Silver Plated Ware, No. 676 Broadway

Webster, E. G. & Bro.—Manufacturers of Fine Silver Plated Ware. Office and Warerooms, 14 Maiden Lane, N. Y.

Show Cases, Etc.

Kraft & Hoffmeister—Manufacturers of Metal Show Cases, Jewelry Trays always on hand, 8 & 13 North William street, N. Y.

Smith, B. & W. B,—Patent Improved Counter Show Cases. Drawings furnished and estimates given for fitting stores in Cabinet Work complete.

Spectacle Case Manufacturers.

Koenen, A. & Bro. Manufacturers of Leather Spectacle & Eye Glass Cases, 81 Nassau St., N. Y

Thermometers Etc.

Tagliabue, Giuseppe—Thermometer, Barometer and Hydrometer Manufacturer, 302 Pearl street near Beekman, N. Y

Thimble Manufacturers.

Burbank Manufg Co.—Manufacturers of Gold & Silver Thimbles, 14 Maiden Lane, N. Y.

Ketcham & McDougall—Improved Gold and Silver Thimbles, Nos. 4 and 6 Liberty Place, near Maiden Lane, N. Y.

Walking Canes.

Fradley, J. F.—Manufacturer of Fine Gold and Silver-headed Walking Canes and Sterling Silverware. Office and Factory, No. 21 John street, N. Y.

Watch Companies.

American Watch Co.—Robbins & Appleton, No. 9 Bond street, N. Y.

Hampden Watch Co.—of Springfield, Mass. Office, No. 12 John St., New York.

Springfield Watch Co.—Factory, Springfield, Ill. Office, 11 Maiden Lane.

Tiffany & Co.—Makers of Fine and Complicated Watches. Office 14 John street, N. Y.

Watch and Chronometer Jeweler.

Queen, James—Watch and Chronometer Jeweler and Pallet Maker, 78 Nassau street, Room 8. Pivots inserted in Pinions, Balance, Staffs, &c.

Watch Importers, Etc.

Aikin, Lambert & Co.—Importers of Watches, Sole Agents for Paul Breton & Chas. Latour, Geneva. A general line of reliable Swiss Watches. Watch Cases of all styles made to order. 12 Maiden Lane, N. Y.

Bartens & Rice—Importers of Watches, Watch and Chrometer Makers. No 3 John street.

Beguelin, Tell A.—Importer of Watches, Watch Materials, Tools, etc. No. 71 Nassau St.

Bodine, G. M.—Importer and Dealer in Watches and Jewelery, etc., also Agent for Bard & Bros.', Gold Pens & Pencils, 22 Maiden Lane.

Bourquin Brothers—Importers of Watches from their own manufactory at Bienne, Switzerland, 20 Maiden Lane, N. Y.

Bynner, T. B.—Importer and Jobber of Watches, Diamonds and Fancy Goods, and dealer in the best class of Rolled Plate Jewelry. 513 Broadway.

Cross & Beguelin—Importers of Watches, Watch Tools and Materials, dealers in American Watches, No. 21 Maiden Lane, N. Y.

DuBois, Francis & Co.—36 Maiden Lane, N. Y., Importers of Watches and Manufacturers of Watch Cases.

Droz, Henry E.—Importer of Watches and Watch Case manufacturer. Agent for the "E. Perregaux" Watch, and jobber in American Watches, No. 92 Fulton Street, N. Y.

Freund Max & Co.—Importers of Watches Jewelry and Precious Stones, 8 Maiden Lane

Gagnebin, Chas.—Importer of all kinds of Watches, 64 Nassau Street. Agent for Ulysse Breting's Fine Chronometers, Chronographs, Anchors, etc.

Gallet, Julien—Importer of Watches. No. 25 John Street.

Ginnel, Henry—Importer of Watches, Tools and Materials. No. 31 Maiden Lane, N. Y. P. O. Box, 2967

Keller, L. H. & Co.—(Successors to G. A. Huguenin,) Importers of Fine Watch and French Clock Materials, No. 64 Nassau street, N. Y.

Hyde's Sons, John E.—Wholesale Commission Agents only, for Jules Jurgensen, of Copenhagen, Ed. Perregaux, Locle, Monard Freres, Geneva, Watches, and of other makers of every quality. No. 22 Maiden Lane

Kahn, L. & M.—Importers of Watches, No. 10 Maiden Lane, New York.

Mathez, F. H.—Importer of Watches. No. 5 Maiden Lane, N. Y.

Magnin, Ve J. Guedin & Co.—Importers and Agents of the Nardin Watch, No. 652 B'way

Mathey, L. & A.—Importers of Fine Watches and Sole Agents for the **H. L. Matile's** Watches, No. 119 Fulton Street, N. Y.

May & Stern—Importers of Foreign Watches, Materials and Tools, etc. Manufacturing Jewelers. No. 19 John St., N. Y.

Nicoud & Howard,—Importers and Manufacturers of Watches, No. 14 John street, N. Y.

Oppenheimer Bros. & Veith, Dealers in Watches and Diamonds, and Manufacturing Jewelers. No. 35 Maiden Lane, N. Y.

Quinche & Krugler.—Agents for the Borel & Courvoisier Nickel Movements, 17 Maiden Lane, N. Y.

Robert, J. Eugene—No. 30 Maiden Lane, New York Agent for Louis Audemar's celebrated watches.

Schwob, Adolphe—Manufacturer & Importer of Watches, 11 Maiden Lane, N. Y.

Stern Brothers & Co.—Importers of Swiss Watches and wholesale dealers in American Watches, &c., 30 Maiden Lane.

Scott, J. T. & Co.—Importers of Watches, and Manufacturers of Jewelry, and Jobbers of all grades American Watches. No. 11 Maiden Lane, N. Y.

Strasburger, Louis & Co.—Importers and Makers of Watches of every description. No. 15 Maiden Lane.

Tiffany & Co.—Makers of Watches. General Agents for Patek, Phillippe & Co. Wholesale office, 14 John street, N. Y.

Watch Cases.

Brown, J. A. & Co.—Manufacturers of The Ladd Patent Stiffened Gold Watch Cases, &c., 11 Maiden Lane, N. Y. Factory, 58 Eddy street. Providence, R. I.

Glatz, Charles—Manufacturer of Gold and Silver Watch Cases. 12 Maiden Lane.

Watch and Chronometer Repairer.

Cerf, B.—Practical Watchmaker and Repairer, No. 10 John street, N. Y. Repairing and adjusting of Fine Watches done for the trade. All kinds of escape and stem winding wheels cut to order.

Ludeman, W. H.—Chronometer and Watchmaker. Repairing of every description for the Trade. 75 and 77 Nassau street, N. Y.

Sirois, A.—Practical Watchmaker, 89 Fulton street. Special attention paid to the repairing of Fine Watches. Pivots inserted.

Watch Case Repairers.

Tarbox, Hiram—Watch Case Repairing, Springing, Polishing and Engine Turning, 79 Nassau street, (room 22), N. Y.

Renaud, F.—Watch-Case Repairer.—Solid and Heavy Rolled Plate Bows and Pendents. Springer and Engine Turner of Cases and Jewelry, 36 Maiden Lane

Watch Guards.

American Silk Guard Manufacturing Co.,—Our goods are warranted all silk.—Kossuth Marx & Co. No. 39 Maiden Lane, N. Y.

Watch Glasses, Shades, Etc.

Hill, Robert S.—Manufacturer of Watch Glasses, &c., dealer in Imported Glasses, Flat Glasses a specialty; also, Jeweler's Glasses. Nos. 75 & 77 Nassau street, N. Y.

CINCINNATI.

Holland, John—Manufacturer of Gold Pens, Pencils and Pencil-cases, Charms and Gold Tooth-picks, at No. 19 W. 4th street, Cincinnati, Ohio.

PHILADELPHIA

Booz & Thomas.—Manufacturers of Gold and Silver Watch Cases and Jewelry, 108 South 8th Street, Philadelphia.

Bennett, Jacob & Son,—Diamond Setters and Manufacturing Jewelers. 108 South 8th St., Philadelphia, Pa.

Cooper & Bros.—Wholesale Jewelers, and Importers of and Dealers in Watch and Clockmakers' Materials, etc. Spectacles and Optical Goods. No. 35 South 4th St., Phila.

Conover David F. & Co.—American Watches, Wholesale Salesroom, southeast corner 7th and Chestnut streets, Philadelphia.

Herold, Chas P.—Successor to Hildebrandt, Herold & Co., Manufacturing Jeweler and Diamond Setter. Diamonds. 916 Chestnut St

H. Muhr's Sons.—Manufacturing Jewelers, Solid Gold Rings a specialty, 158 North Second st. New York Office, 11 Maiden Lane.

Kolb, G. F. & Son.—Manufacturer of fine Morocco, velvet and Cabinet Cases for jewelry watches and Silverware. 722 Sansom street.

Krider, Peter L.—Manufacturer of Sterling Silver Ware, Artisan Hall, No. 618 Chestnut street

Levy, Bernard—Manufacturers of gold and silver watch cases, and importers and dealers in Swiss and American watches, 402 Library street, Philadelphia.

McCall & Newman—Manufacturing Jewelers, Filled Plain Gold Rings a specialty, No. 625 Arch street.

Morgan & Headly.— Manufacturing Jewelers Cameo sets, Gold sets, Roman Lockets, Rings, Coral sets, and a general line of rich goods. 611 and 613 Sansom street, Philadelphia.

Pierson, Edwin,—Manufacturer of Fine Imitation Jewelry, Gold and Silver Electro-plater, Fire Gilder, Coloring, Etruscan and Gold Jewelry a specialty. 1223 Chestnut St.

Rosenthal, G. F. C.—Manufacturing Jeweler and Diamond Setter. Engraving and Designing of Monograms a Specialty. No. 924 Chestnut street, Philadelphia.

Scherr, L. A. & Co. Wholesale Dealer in Watches Silver Plated Ware, Spectacles, Fancy Goods, Watch Materials, etc., 726 Chestnut street.

Sheafer, W. H. & Co.—Makers of Fine Jewelry 908 Chestnut Street.

Simons, Brother & Co.—Manufacturers of Gold and Silver Headed Canes and Gold and Silver Thimbles. 611 & 613 Sansom St., Phila.

CHICAGO.

American Watch Company, of Waltham, Mass. No. 170 State street, Chicago.

Charpier & Wathier.—Watchmakers and jewelers for the trade, and dealers in all kinds of watch materials. 61 West Kinzie street.

Frese, B.—Watchmaking and Repairing for the Trade promptly attended to. Stem-winding and escape wheels cut to order. No. 99 E. Madison St., Chicago, Ill.

Purdy, J. H. & Co.—Jobbers of large and small Tools and Materials, for the use of Watchmakers, Jewelers, and kindred Trades. Spectacles—Jewelry Boxes, Plated Chains, &c., &c. No. 170 State street.

PROVIDENCE

Irons, Chas. F.—Manufacturer of Solid Gold Jewelry. Specialty Emblems, Pins and Charms Masonic, Odd Fellows, &c. 102 Friendship St.

Perkins, C. H.—Successor to Davis, Platt & Co, Manufacturer of Fine Gold Jewelry. Specialty, Ladies' Setts, Brooches and Earrings. No. 20 Conduit St., Providence, R. I.

NEWARK.

Condit, Hanson & Van Winkle.—Manufacturers of Machines for Electro-plating, &c.

Lefort, Henry.—Stem-winding Watch Crown Manufacturers. 80 & 82 Marshall St.

Lelong, L. & Bro.—Gold and Silver Refiners, Assayers and Sweep Smelters, S. W. corner Halsey & Marshall streets, Newark, N. J.

Milne & Jourdan—Manufacturers of Stem-winding Watch Crowns Nos. 13 & 15 Franklin Ave., Newark, N. J.

Prince, David—Gold and Silver Refiner, Assayer and Sweep Smelter. Sole Agent for Comin's Improved Amalgamator. 63 Railroad Ave.

Van Houten, Sayre & Co.—Manufacturing Jewelers, 53 Chestnut street, Newark, N. J.



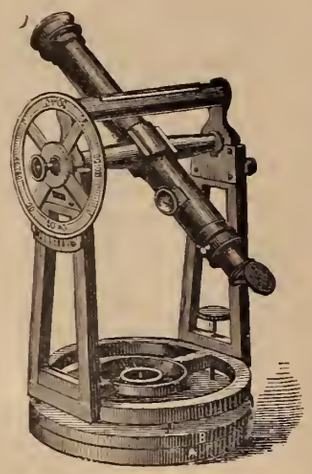
Standard Marine Chronometer
FOR KEEPING CORRECT TIME.

JOHN BLISS & CO.

STANDARD MARINE

Chronometers and Transits,

FOR WATCHMAKERS' USE.



No. 10

110 WALL STREET, NEW YORK.

IMPORTANT NOTICE.—These Transits are readily set in position without the aid of strictly correct time as a basis for that purpose. Printed instructions, easily understood, accompany each Instrument, and no calculations are required preliminary to setting in position.

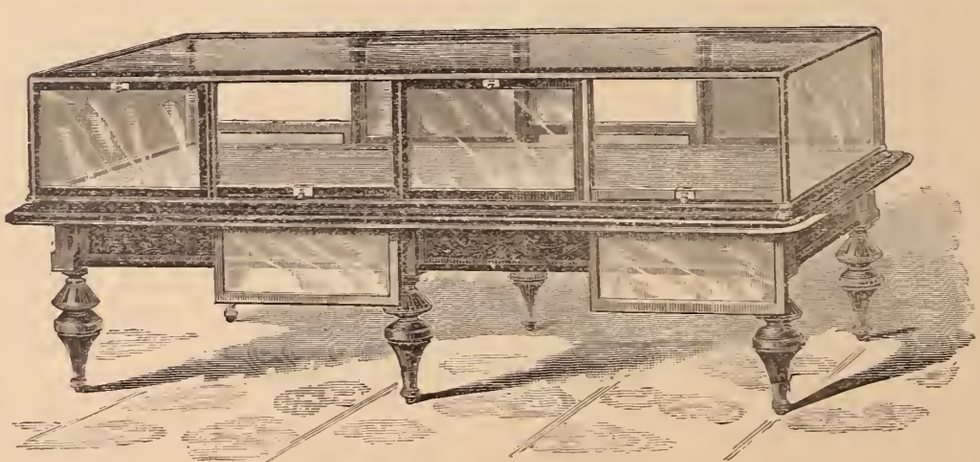
As a trial only is required to insure unqualified approval, we are induced to make the following **LIBERAL OFFER**—On receipt by us of satisfactory reference, and 10 per cent. of the price, we will send one of the foregoing Transit Instruments, on hire or trial, for one month, with full printed instructions for setting up and using the same, and if purchased after trial, we will allow the whole hire to apply in part payment, and sell the Instrument on approved note at four months for the balance. Special terms for payment by installments, after trial, on application. We do not make this offer merely to hire these instruments, but to insure a trial with a view to sales, the hire received being only sufficient to cover the cost of repolishing in case they are returned. Send for Illustrated Circular giving full description.

JOHN BLISS & CO., 110 Wall Street, New York

PATENT IMPROVEMENT IN COUNTER SHOW CASES,

PERPENDICULAR SLIDING DOOR, DUST-TIGHT.

CENTER COUNTER CASE DOORS RUNNING THROUGH BOTH SIDES.



Its advantages are as follows:—The doors are more conveniently opened and closed, less liable to get out of repair or broken, articles are more easily reached in wide cases, mirrors are more safe, it dispenses with hinges, economizes room, excludes dust, and is air tight *when closed.*

☞Drawings furnished and estimates given for fitting stores in cabinet work complete.

REFERENCES:—Gorham Mf'g Co., Rogers & Bro., Mitchell, Vance & Co
Meriden Britannia Co., M. S. Smith & Co., Detroit, Mich.
D Valentine, Syracuse, N Y.

B. & W. B. SMITH,

220 West 29th Street, New York.



French Clocks, strike, visible escapement, from $20.00 upwards.

ALBERT BERGER & CO.

IMPORTERS OF THE

W. B. & Co. Watch Glasses, Spectacles,

FRENCH CLOCKS, REGULATORS, MUSICAL BOXES, &c.

☞ *Also Lemaire & Bardour & Sons' Opera and Field Glasses.*

No. 47 Maiden Lane, New York

Factory at Goetzenbruck, Lorraine.

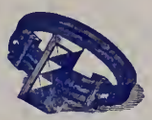
No. 21 Hatton Garden, London. No. 27 Rue-Paradis-Poissonniere, Paris.

— ESTABLISHED 1837.—

GEO. O. STREET & SON,

Makers of Fine Jewelry

126 Kearny St.
San Francisco, Cal.



15 John Street,
NEW YORK.



We would respectfully call attention to our PATENT EXTENSION RINGS and BRACELETS. They are strong and durable; there are no snaps and joints to get out of order; are easily expanded to admit the hand or fingers, and as easily closed by a slight pressure on the finger guides on the side.

Stone Cameo Goods, Rings, Etruscan Work, &c.

EXCLUSIVELY OF OUR OWN MAKE.

F. P. LOCKLIN,

MANUFACTURER OF

Gold and Silver-Plated

Walking Canes,

JEWELRY

&c., &c.



FACTORY,

142 Fulton Street, New York

Between Broadway and Nassau street.



In placing these Oils before the Trade, we do so with entire confidence, from many years' experience in procuring them from the fish, and in their preparation for use, and more than all, the thorough and SEVERE TESTS they have been subjected to in use upon Chronometers in our whale ships, often absent from fifty or sixty months. ☞ Liberal samples furnished on application.

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MANUFACTURERS OF

FINE GOLD JEWELRY

No. 15 Maiden Lane, New York.

SPECIALTIES.

STONE CAMEO, ONYX, AMETHYST, TOPAZ, PEARL AND TURQUOISE RINGS.

HENRY MAY. Established 1854. JOSEPH STERN.

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IMPORTERS OF

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AGENTS FOR THE SALE OF ALL

DOMESTIC MOVEMENTS AND CASES,

And MANUFACTURING JEWELERS

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☞ **SOLID GOLD SEAL RINGS, in Cameo, Amethyst, Topaz and Onyx, A SPECIALTY.**

L. LELONG & BROTHER,

GOLD & SILVER REFINERS,

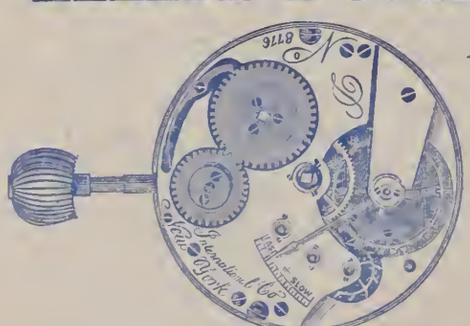
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SWEEPINGS A SPECIALTY.

KELLER & UNTERMEYER,



AUTHORIZED AGENTS FOR THE SALE OF THE

INTERNATIONAL

WATCH CO.'S

WATCHES.

☞ A full and complete assortment of these goods in new and attractive Cases constantly on hand.

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JEWELER AND SILVERSMITH,

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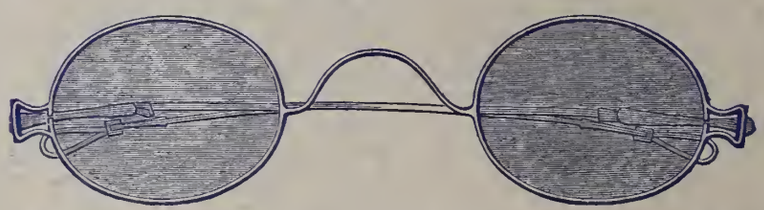
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MANUFACTURER OF

PATENT ACCOMMODATING

Spectacles and Eye Glasses,

In Gold, Silver, Steel, &c.



Also Latest Novelties in Fine WATCHES & JEWELRY.

PRICES REDUCED TO SPECIE BASIS.

☞ I would call especial attention that with the above Spectacles and Eye Glasses it is only necessary to have one complete assortment of the different kinds of lenses, which being of uniform size, will interchange in all the different kinds of frames, thus giving a complete assortment for a comparatively small outlay

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LORSCH BROS., 120 Sutter St., San Francisco. Cal.

L. & M. KAHN,

IMPORTERS OF

Sole Agents for James Kahn. E. Bourquin & Fils AND Alphonse Matile WATCHES.

WATCHES

112 Kearny St. San Francisco, CALIFORNIA.

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No. 10 MAIDEN LANE,

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☞ *Manufacturers of the* EAGLE TIMER ! *the Best in the market.*

New Haven Clock Co.,

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OFFICES AND SALESROOMS:

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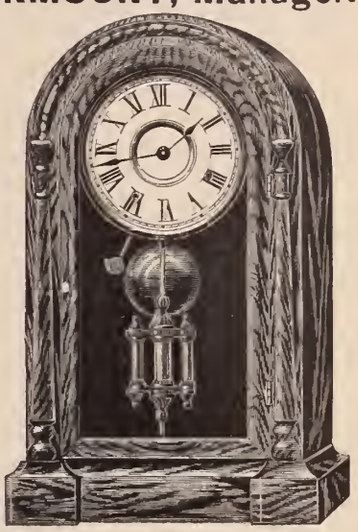
MANUFACTURERS OF

Clocks & Movements

—AND—

Clock Materials of Every Description.

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☞THE TRADE SUPPLIED WITH ILLUSTRATED CATALOGUES AND PRICE LISTS.

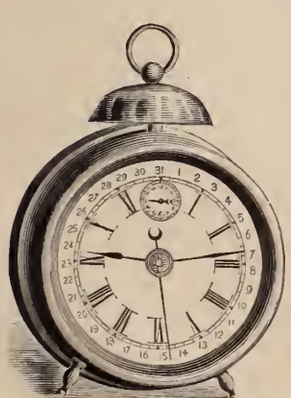
Waterbury Clock Comp'y

MANUFACTURERS OF AMERICAN CLOCKS,

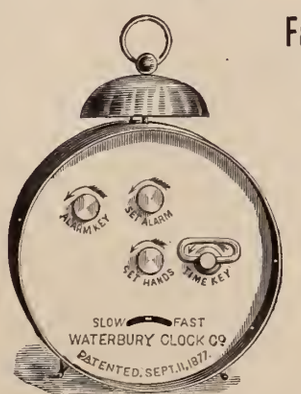
No. 4 Cortlandt Street, New York. No. 197 State Street, Chicago.

Factories, - Waterbury, Conn.

M. BAILEY, Treas.

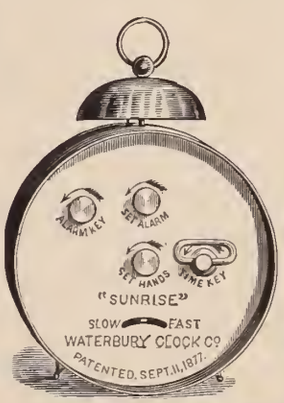


"MONITOR."
30 Hour Lever Time, Alarm Calendar.





"CRICKET."
30 Hour Lever Time.





"SUNRISE."
30 Hour Lever Time, Alarm.

☞**Are Stem-Winders, No Keys Required, Reliable Time-Keepers, Will Run in any Position, Separate Alarm Spring Set and Regulate at the Back. Nickel-Plated Cases.**

SOLE AGENTS FOR THE ITHACA CALENDAR CLOCK COMPANY.

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J. C. AIKIN. H. A. LAMBERT. J. B. SHEA.

AIKIN, LAMBERT & Co.,

MANUFACTURERS OF GOLD PENS,

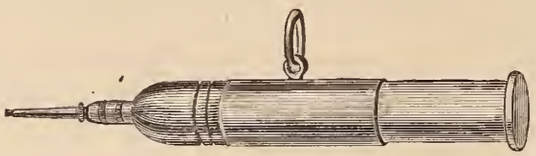
Pen and Pencil Cases, Pencils, Tooth-picks, and "Novelties" in Pencil Goods.

No. 23 Maiden Lane, New York,



Would call the attention of the Trade to our large and complete line of Pen Goods in all styles and varieties, suitable for the Winter and early Spring demand.







☞Our introduction last season of Pencils in NEW AND ENTIRELY NOVEL DESIGNS was marked by an unprecedented demand, which establishes the sale of these goods as STAPLES, and as being suited to any season of the year.

The Magic Charms (as per cuts shown below), inlaid with pearl and gold, in form of vines, flowers, birds, etc , on celluloid of assorted colors, in imitation of malachite, tortoise shell, agate variegated marble, etc., are the LATEST and most novel pencils in the market.





Send for circular and new list.

Branch, No. 113 East Madison Street, Chicago.

"Practical Hints on Watch Repairing,"

BY "EXCELSIOR."

Including making fitting, testing and adjusting hair-springs, the adjustments for isochronism, position, heat and cold and rate.

Giving full practical directions on every point, with descriptions and illustrations of new tools, methods and principles never before published.

This work is unanimously pronounced the most complete, trustworthy and practical treatise on the balance-spying, and all the adjustments required in even the finest watches and chronometers, ever published. Unlike other writers on these subjects, "Excelsior" has not given mere theoretical propositions, of no real value, nor kept anything back for fear of teaching the trade too much, or raising up competitors to interfere with his profits, but he has honestly and candidly told whatever the practical workman needed to know to make even the most abtrusive points clear to all, whether old hands or new beginners. His mode of treating the subjects is unique,—giving enough of the principles which underlie the process to enable the workman to proceed understandingly, but, beyond that, he confines himself entirely to practical details, omitting none, however minute, essential to be known.

Will be sent to any address in the U. S. on receipt of price, $3.50.

D H. HOPKINSON, PUBLISHER, 42 Nassau Street, N. Y.

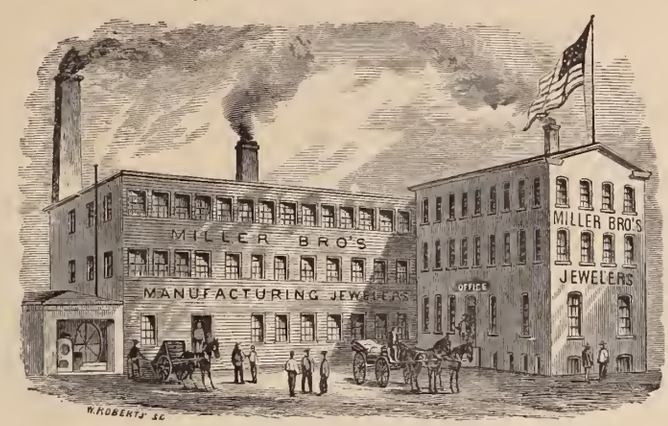
MILLER BRO'S,

MANUFACTURING JEWELERS,

No. 11 MAIDEN LANE, NEW YORK.

Manufactory, 47, 49 & 51 Franklin Street, Newark, N. J.

INITIAL GOODS A SPECIALTY!



Seals, Lockets, Sets, Sleeve Buttons, Studs, Collar and Chemise Buttons.

ATTENTION IS INVITED TO OUR

NEW STYLES OF ETRUSCAN SLEEVE BUTTONS,

MOUNTED WITH

RUSTIC LETTERS

BIRDS, ANIMAL HEADS AND FANCY ORNAMENTATIONS

DAVID F. CONOVER & CO.,

(Successors to Wm. B. Warne & Co.)

Importers, Manufacturers and Wholesale Dealers in

WATCHES AND JEWELRY,

Silver and Silver-Plated Ware,

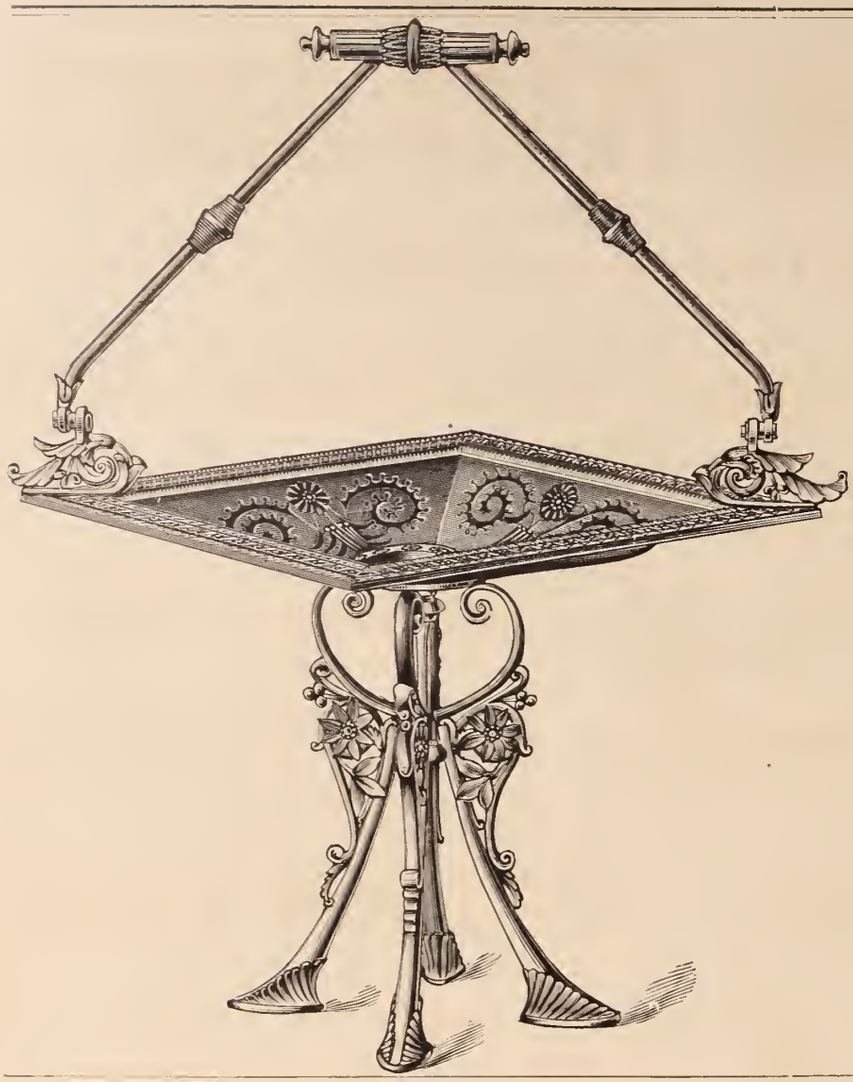
American Watch Wholesale Salesroom,

Southeast Corner Chestnut and 7th Sts.,

(FIRST FLOOR.)

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SILVER-PLATED WARE

MANUFACTURED BY THE

MERIDEN BRITANNIA COMPANY,

46 East 14th Street,

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SIMPSON, HALL, MILLER & CO.

Manufacturers of Fine Silver-Plated Ware,

Factories. Wallingford, Conn. Salesroom, No. 676 Broadway N. Y.



One of the oldest and most reliable manufactories in the country.

Our assortment includes a large and complete line of Hollow Ware, comprising many new and beautiful designs especially produced for the Holiday trade. The attention of the trade is particularly called to these new articles which possess the highest merits, both of construction and ornamentation. Many novelties have recently been added to our line.

Our Solid Table Ware is made of the best Nickel Silver.

SPOONS, FORKS, LADLES, PIE KNIVES, &C.

In great variety of Patterns.

Solid Steel Knives of Superior Quality.

REMOVAL.

We will remove our Salesroom to No. 36 East Fourteenth Street, Union Square, about February 1st, 1879.

NOTE.—We have just issued an illustrated catalogue of our wares, which has been in preparation for several months. This book we will furnish to dealers on application.

THE MIDDLETOWN PLATE COMP'Y,

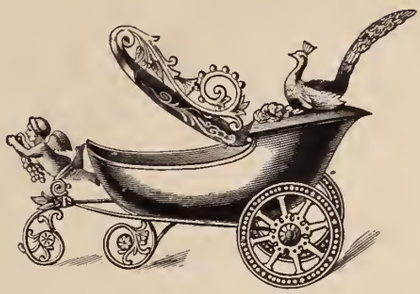
MIDDLETOWN, CONN.

Offer a full assortment of their Superior ELECTRO-PLATED WARE

in Staple and Fancy Goods.

No. 17 Patent Jewel Box.

Cover opens by rolling on the wheels



Many Novelties for Presents !

ESPECIALLY

In Fancy Card Receivers, Vases, Jewelry Boxes, Toilet Sets, &c.

No. 13 JOHN STREET, NEW YORK.

The STAR SALT CASTOR COMP'Y

Sole Proprietors and Manufacturers of

CELEBRATED

STAR SALTS

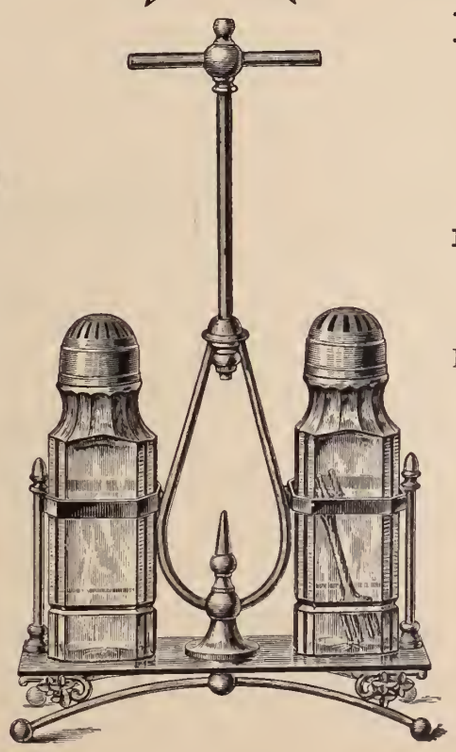
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☞ For convenience, neatness and utility the STAR SALTS have become a household necessity.

The pulverizer in the bottle, as shown by the cuts, keeps the salt pulverized, and obviates the disagreeable habit of spilling the salt by dipping out of an open salt cellar.







No. 161 Franklin Street,

BOSTON, MASS.

Place these in the family and Salt Cellars will be discarded.

MANUFACTURED IN ALL VARIETIES OF PLAIN AND FINE CUT GOODS, CASTERS, &c.





☞ For full descriptions of the above goods see our Illustrated Catalogues, which will be mailed on application. Special care given to orders for exportion.

NOVELTIES:

White Celluloid And SILVER.

White Celluloid And GOLD.



Simple, Durable, Beautiful, Economical.

COLBY & JOHNSON,

Patentees and Exclusive Manufacturers.

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MANUFACTURERS OF

Fine Watches, Regulators, Office Clocks,

Electric Watch Clocks & Tower Clocks,

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Corner Fourth Street, NEW YORK.

No. 114 TREMONT STREET, BOSTON.

J. W. J. PIERSON, - - AGENT.

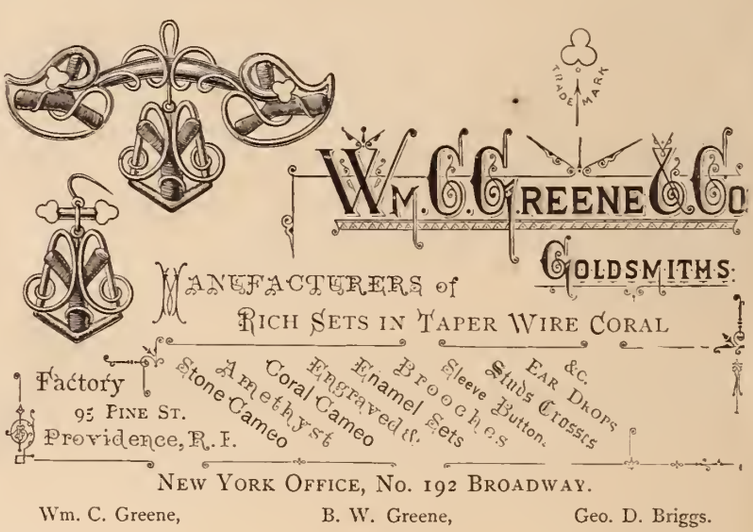
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MANUFACTURERS OF

FINE JEWELRY,

NO. 5 MAIDEN LANE, NEW YORK.

Factory, Newark, N. J.



J. H. PURDY & CO.

Jobbers of Imported and Domestic

TOOLS & MATERIALS,

For the use of Watchmakers, Jewelers, and kindred trades.

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OFFICE WITH CHAS. WENDELL & CO.

BUCKENHAM, COLE & SAUNDERS,

SUCCESSORS TO

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Diamonds, Pearls

AND OTHER PRECIOUS STONES,

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☞A large stock of FINE DIAMONDS, Mounted and Unmounted kept constantly on hand. Goods sent on approval to any part of the country on receipt of satisfactory references.

DENNISON MFG. CO.

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Paper Boxes, Jewelry Cards, Tags,

PINK AND WHITE COTTON,

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TISSUE PAPERS. Proprietors "Globe," and Centennial Prize "Excelsior," and Importers of English Grass, Bleached and Colored Tissue Papers, from the celebrated 39 mill.

Sole Proprietors of Millers' Specialties!

JEWELRY CASKETS, SILVER WHITE CASKETS, and

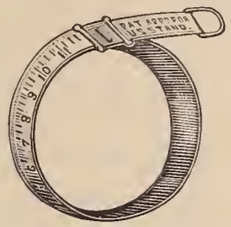
SILVER WHITE, the best article for Cleaning Silver and Plated Ware. Samples furnished the Trade for distribution.

Boston, New York, Philadelphia, Chicago, Cincinnati, St. Louis.

KOSSUTH MARX & COMP'Y,

39 MAIDEN LANE, New York.

THE U. S. STANDARD FINGER SIZE FOR RINGS.



TIME AND TROUBLE SAVED.

Some of the advantages of which, will be found annexed and must be apparent to every Jeweler.

1st. It avoids danger of having rings stolen from tray while trying on to find one the size wanted, and also of being misled after taking the size.

2d. It saves time consumed in measuring ring on stick and avoids possibility of making a mistake in doing so, as the size ring is guaged in accordance with the U. S. Standard Stick.

3d. It necessitates trying but one ring on the finger, whereas a dozen had sometimes to be used before the correct size was obtained.

4th. If the salesman is hurried it is not necessary to make a memorandum of the size, as the ring will remain at the size taken, and can be laid aside until some leisure time.

5th. It can be loaned to customers whereby th y will be enabled to take the correct size, instead of using pieces of string and wire, thus making mistakes and often necessitating altering a ring two or three times.

HOW TO USE— Place the thumb of the hand, on which is the finger to be measured, against the joint on the size ring, and draw tight with the other hand.

☞FOR SALE BY ALL WATCH MATERIAL DEALERS

SAXTON, SMITH & CO.

MANUFACTURERS OF

Fine Gold Chain.

No. 194 BROADWAY

New York.

Factory, No. 183 Eddy Street, Providence, R. I.

☞ **Sole Agents for the new PATENTED CHAIN BAR, containing a Detachable Pencil.**

WOOD & HUGHES,

STERLING

Silverware Manufacturers

No. 16 JOHN STREET,

NEW YORK.

Van Houten, Sayre & Co.,

Manufacturers of Fine Jewelry,

FACETED GOODS,

Office & Factory, 53 Chestnut Street,

NEWARK, N. J.

KREMENTZ & CO.,

MANUFACTURERS OF

FINE JEWELRY,

No. 13 John Street, New York.

Factory, 361 Mulberry Street, Newark, N J.

GOODS OF OUR OWN MAKE EXCLUSIVELY.

"THE RAPHAEL"

Is a rich, soft and highly ornamented pattern, good substantial weights, Teas weighing 9½ and 12 ounces, Dessert, 19 ounces, and Tables 28 ounces per dozen. Possessing the desirable features of elegance in design and outline, and ranging in weight from medium to heavy; it has been most favorably received by the trade and has become one of our leading patterns, especially in flat ware, where design is a feature of prime importance.

"THE HINDOSTANEE"

Is made with a view to meet the want for a spoon equal to the "*Raphael*" in beauty of design, but of a lighter weight, ranging from light to medium. The style of ornament, as shown in the illustration, is as its name indicates, Indian or Hindostanic.

It is graceful in outline, elegant in detail of design, entirely free from the objectionable features of sharp edges, and by the proper distribution of Silver, the very desirable feature of strength in the "*shank*" is obtained, giving to it the appearance of a much heavier spoon. Teaspoons, 7½, 10 and 12 ounces, Dessert, 14 ounces, and Tables, 20 and 24 ounces per dozen.

"THE KINGS"

Is also a substantial pattern, similar in character and feeling to the King's of foreign manufacture, which has for many years been accepted as the standard pattern in the English market. In weight it is similar to the "*Raphael*."

"THE SWISS"

Meets the want for an ornamented pattern of light weight. Teaspoons weighing 7 ounces, Dessert 12 ounces, and Tables 18 ounces. It is tasteful in design, and being light in weight it has been most favorably received by a large portion of the trade.

"THE COTTAGE"

In certain very desirable characteristics has never been surpassed. Its great popularity has stimulated the production of imitations, but as its beauty consists not only in its simplicity but perfection in outline, even the slightest deviation sufficient to avoid infringement of patent is fatal.

"THE NEW TIPT"

In the introduction of this pattern we have succeeded in furnishing an ornamented pattern, which for cheapness closely approximates the old plain tipt.

"THE ANTIQUE"

We invite special attention to this pattern, pronounced by the leading jewelers to be the very best plain pattern in the market. Perfectly plain and symmetrical in outline, the tip smooth, heavy and so perfect in line as to give tone and character to the entire spoon.

THE "ROMAN" AND "OLD ENGLISH"

IN GORHAM PLATE.

It is our object in placing these patterns upon the market to offer to the trade the best article in plated spoon work that can possibly be made. Equal in design and finish to those in solid silver, and undistinguishable from them.

ORNAMENTATION.

Our new method of treatment in the ornamentation of Flat Ware wherein we have introduced the most pleasing effects in color engraving and chromatic surface decoration, has greatly enhanced their popularity. While *novelty* is an essential feature in decoration, it should nevertheless be always subordinate to consistency in design. We claim to give to these wares of utility that elegance and consistency in design which meets the views of a cultivated taste and renders to articles of every day use a refining and educating influence.

"CASE COMBINATIONS."

Our extensive variety of desirable patterns and the various styles of finish and decoration enables us to offer to the Trade an almost endless series of combinations for spoon work and accompanying pieces in flat and hollow wares, tastefully encased in Morocco and other leathers, and in plain and ornamented woods.

The Cases are of our own manufacture and possess the desirable features of good taste and durability, and are offered at as favorable prices as is consistent with wares of equal quality.

While we are furnishing a line of low priced cases to meet the demands for inexpensive goods, we take pleasure in offering a line of cases which are receiving universal commendation, and at prices unquestionably cheap for the quality of ware submitted. When competition has for its aim *cheapness* rather than *excellence*, without a due regard to the *taste* and *quality* of the production, it becomes a certain cause of rapid decay to all classes of manufacture.

"COFFEE SPOONS."

The attention given to this class of Spoon Work has resulted in a large and steadily increased demand. "THE MOTHER'S" pattern (antique in design) is perfectly adapted for the purpose, has met with a large sale, and led to an increased demand in all the regular patterns.

As this class of Spoon Work is almost invariably called for in cases, the beauty of the cases has rendered them particularly desirable for presentation purposes, while for general table use the coffee spoon is in growing demand.

The most popular combinations are

6 or 12 Coffee Spoons, *either large or small.*
6 " 12 " " and 1 Sugar Spoon.
6 " 12 " " " 1 pair Sugar Tongs.
6 " 12 " " " 1 Cream Ladle.
6 " 12 " " 1 Cream ladle, 1 pair Sugar Tongs.
6 " 12 " " 1 " " 1 Sugar Spoon.

For such combinations, the latest novelty in style, appropriately termed **"The Harlequin."** has become very popular. The effect of 12 differing from each other in pattern meets with general favor. This has led to the introduction of the latest novelty in this department,

Decorated Coffee Spoons,

wherein each spoon, though of the same outline, but differing in ornament, is rendered particularly attractive by its novel style of decoration, engraved in colors and in endless variety of ornament.

"FLAT WARE."

Our extensive and meritorious assortment of patterns in Spoons and Forks enables us to offer the best assortment of accompanying pieces in Flat Ware, consisting mainly of

KNIVES.—Butter, Cake, Cheese, Crumb, Dessert, Fish, Ice Cream, Melon, Pie, Macaroni, Paper, Pickle, Fruit, Waffle, Pudding, Salad, Bread, Jelly, &c.

FORKS.—Pickle, Oyster, Olive, Salmon Sardine, Toast, Vegetable, Fish, Pie, Macaroni, Beef, Melon, Salad, &c.

SPOONS.—Ice Cream, Berry, Coffee, Egg, Gravy, Ice, Jelly, Salt, Mustard, Nut, Olive, Pap, Preserve, Salad, Individual Salad, Sugar, Vegetable, Pudding, Soup, Toddy, Honey, &c.

LADLES.—Soup, Oyster, Gravy, Olive, Cream and Punch,

TONGS.—Sugar, Ice, Beef, Asparagus, Salad, Pickle, Celery, Toast, &c.

MISCELLANEOUS.—Sugar Lifters, Cheese Scoops, Oyster Servers, Cake Servers, Berry Scoops, Lobster Scoops, Marrow Scoops, Nut Picks, Nut Crackers, &c.

GORHAM MANUFACTURING CO.,

Manufacturers of STERLING SILVERWARE,

Of the highest character and in all branches of the art.

MAKERS AND SOLE PROPRIETORS OF THE GORHAM PLATED WARES,

SO WELL AND FAVORABLY KNOWN TO ALL DEALERS.

Factory, Providence, R. I.

Salesroom, 37 Union Square, New York.

RAPHAEL. *HINDOSTANEE.* *KING'S.* *SWISS.* *COTTAGE.* *NEW TIPT.*



Lithographic sheets of our complete list of TWENTY *different patterns of Spoons and Forks, showing the most desirable, as well as the most extensive line, will be sent to the Trade upon application.*

WE submit for the convenience of the trade, illustrations of six of our leading Spoon and Fork Patterns, viz., the "RAPHAEL," "HINDOSTANEE," "KING'S," "SWISS," "COTTAGE," & "NEW TIPT."

In the patterns we are prepared to meet orders from stock, while the remaining patterns will be made to order and supplied at reasonable notice.

In addition to the Patterns herein illustrated are

"LADY WASHINGTON," "KNICKERBOCKER," "CORINTHIAN," "ROSETTE," "GORHAM," "ANTIQUE," "PALM," "LOUIS XIV," "THREADED," "PLAIN TIPT," "QUEEN," and "GRECIAN" in Sterling Silver, and the "ROMAN" and "OLD ENGLISH" in Gorham Plate.

WHITING M'F'G COMPANY,
SILVERSMITHS.

TRADE  MARK.

STERLING

WORKS & WAREROOMS,

Broadway & Fourth St., New York.

WHOLESALE ONLY.

BALDWIN, SEXTON & PETERSON

MANUFACTURERS OF

Fine Jewelry,

Diamond and Stone Cameo Goods,

GOLD CHAINS, &c.

Importers of Diamonds, Pearls, Emeralds, Rubies, &c.

WHITING BUILDING,

Cor. Broadway and Fourth Street,

NEW YORK.

CARTER, HOWKINS & SLOAN,

Makers of Fine Jewelry

Consisting of Chains, Bracelets, Sets, Pins, Studs, Sleeve Buttons, Rings, &c., in Roman, Etruscan and Enamel.

Whiting Building, Corner Broadway and Fourth Street,

A. CARTER JR.
WM. HOWKINS,
A. K. SLOAN.

NEW YORK.

C. E. HASTINGS,
GEO. R. HOWE,
W. T. CARTER.

Established 1817.

Ve. J. MAGNIN, GUÉDIN & CO.

Manufacturers and Importers,

FINE SWISS WATCHES,
REPEATERS, CHRONOGRAPHS & CALENDARS.
GENEVA GOLD JEWELRY,
FRENCH CLOCKS AND BRONZES,
RICH FANCY GOODS,
HORSE-TIMERS & PODOMETERS,
GOLD AND SILVER CHATELAINE WATCHES.

No. 29 UNION SQUARE, corner 16th Street, New York.

☞Gold Medal Awarded, Paris Exposition, 1878.

Sole Agents for the James Nardin Watch.
House in Geneva, 14 Grand Quai.

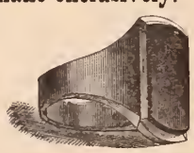
HALE & MULFORD,

MANUFACTURERS OF

RICH JEWELRY,

☞First-class Goods of our own make exclusively.





Special attention is called to our Patent STONE BACK SEAL RINGS.

☞*Send for illustrated circular.*

No. 694 Broadway, cor. 4th Street, New York.
(WHITING BUILDING).

Established 1813.

THOMAS G. BROWN,

MANUFACTURER OF

FINE JEWELRY,

NEWARK, N. J.

—AND—

9 BOND STREET, NEW YORK.

WM. S. HEDGES & CO.,

Of the late firm of SMITH, HEDGES & CO.

IMPORTERS OF

DIAMONDS,

No. 170 Broadway, cor. Maiden Lane,

NEW YORK.

Choice Brilliants in single stones and matched pairs a specialty.

Established 1846.

WILLIAM RIKER,

No. 5 Maiden Lane, New York.

Factory, 42 Court Street, Newark N. J.

☞ *Would call the attention of the Trade to our Inlaid Bracelets.*

CHATELLIER & SPENCE,

Manufacturing Jewelers,

652 BROADWAY, NEW YORK.

No. 1129 Chestnut Street, PHILADELPHIA, PA.

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ENOS RICHARDSON & CO.

MANUFACTURERS OF

FINE GOLD JEWELRY,

Gold Chains, Lockets, Crosses and Necklaces,

COLORED AND ETRUSCAN WORK.

All Goods sold strictly of our own manufacture.

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THE CELEBRATED WOVEN FABRIC

GOLD CHAIN.

Elegantly Mounted Bracelets, Opera, Leontine,

VICTORIA WATCH GUARDS & NECKLACES, in all the Newest Designs.

☞ Our stock is unusually complete, and, in addition to the above, a variety of **Necklaces**, from 1½ to 40 dwt. each, to which we invite the attention of buyers.

No. 9 John Street, New York.

Factory, 46 Greene Street, Newark, N.J.



Nº 24 DOELEN STRAAT AMSTERDAM, HOLLAND.
Nº 1 GAERTNER PLATZ MUNICH, GERMANY.

☞ *Diamonds loose and mounted sent on approval on receipt of satisfactory reference.*

MANUFACTURERS OF FINE JEWELRY

ALLING BROS. & CO.

Full Line of Roman and Mosaic Goods,

Earrings, Buttons, Studs and Rings.

SPECIALTIES:

ENGRAVED AND ENAMELED BANDS,

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170 BROADWAY, NEW YORK.

CHATTERTON & DODD,

Makers of Fine Jewelry

Consisting of Sets, Pins, Ear-Rings, Lockets, Crosses, Sleeve Buttons, Studs, &c.

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ROMAN, ETRUSCAN AND ENAMEL WORK GENERALLY, SPECIALLY DESIGNED BY US.

DYER BRAINERD. JOHN W. STEELE

BRAINERD & STEELE,

MANUFACTURERS OF

Brainerd's Pat. Lockets,





(Patented June 17, 1874.)

These Lockets combine both beauty and strength. They are made of solid 14kt. gold, and the stone are the finest obtainable in the market. They cost no more than those of the old style, if indeed as much; and the combination of secrecy and durability renders them much more desirable. We make three sizes in four different shapes—round, oval, cushion and oblong square; and also Sleeve Buttons of the same style, containing a concealed box for miniatures, a novelty new to the Trade.

FINE GOLD JEWELRY,

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CARROW, CROTHERS & CO.,

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FINE JEWELRY,

No. 12 John Street, New York.

Specialties!

FINE LINKED SLEEVE BUTTONS, ROMAN BAND BRACELETS, LOCKETS & CROSSES.

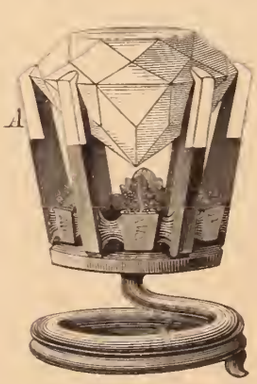
N. B.—We desire to call the attention of the Trade to our IMPROVED BRACELET CATCH, and our new styles of Link Sleeve Buttons.

Platinum Tipped Diamond Settings,

Patented April 16th, 1878, by

Ripley, Howland & Co.





Office, No. 35 Maiden Lane, New York.

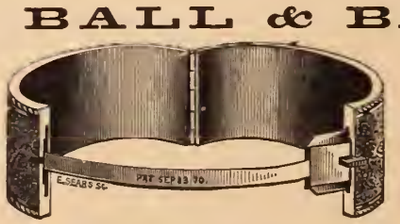
Factory, 383 Washington Street, Boston, Mass.

Established 1845.

WILLIAM H. BALL,

SUCCESSOR TO

BALL & BARNARD,



MAKER OF

Roman, Enameled and Engraved

BANDS.

Having given the manufacture of Band Bracelets my entire attention for a number of years, it has been my desire to make a durable article, one that will give satisfaction to the seller as well as the wearer. I desire to call the attention of the trade to the reduction I have just made in prices, still keeping up the standard as to quality, finish and workmanship. To each pair of BANDS I attach my patent guard without extra charge—thus saving the price of chain—which for seven years past has given entire satisfaction.

No. 9 JOHN STREET, NEW YORK.

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Medal and Diploma of Merit
Awarded by Centennial Com.

S. C. JACKSON,

MANUFACTURER OF FINE

CASES

For Jewelry, Silver Ware, Trays, &c.

180

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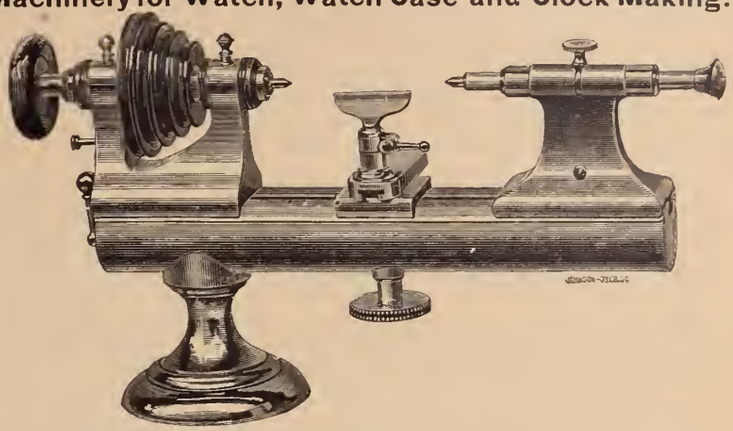
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P. O. Box 999. WALTHAM, MASS.

MANUFACTURERS OF THE WHITCOMB LATHE,
AND
Machinery for Watch, Watch Case and Clock Making.



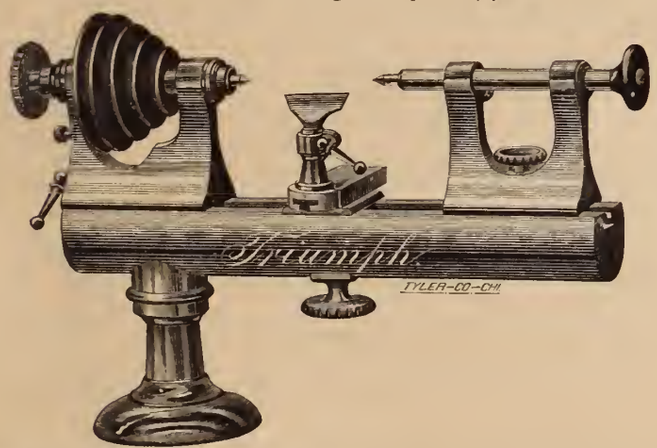
Chicago Office with Chas. Wendell & Co., No. 170 State Street.

Kearney & Swartchild,

Manufacturers of

"TRIUMPH" LATHE.

Price, Hardened Bearings and Spindles, $40.00



☞All Split and Wire Chucks are tempered and ground, which makes them perfectly true.



Importers and Jobbers of Tools and Materials, Watches, Jewelry, &c.

☞**Manufacturers of Watchmakers' and Jewelers' Tools.**

☞Illustrated Catalogue sent on application.

Nos. 113 & 115 State Street, Chicago, Ill.

NATHAN E. MORGAN. CHAS. B. HEADLY.

MORGAN & HEADLY,



MANUFACTURERS OF FINE JEWELRY, PLAIN GOLD RINGS, DIAMOND MOUNTINGS, SPECTACLES AND EYE GLASSES.

Importers of Diamonds.

A full line of Diamonds, mounted and unmounted, always on hand, which we will send on approval to the Trade, on receipt of reference.



☞We have added to the manufacture of Gold Spectacles and Eye-Glasses those of Steel, and are able to fill all orders promptly.

Illustrated Catalogues sent on application.

ARTISAN HALL,

Nos. 611 & 613 SANSOM STREET,

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EDWARD TODD & CO.

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GOLD PENS,



Pencil Cases, Tooth Picks, &c.

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C. F. A. HINRICHS,

29, 31 and 33 PARK PLACE,

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Successor to M. WERCKMEISTER.

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GLASS-WARE,

China, Bronzes, Clocks, Toys, &c.

Sole Agents for the Glass Factories of the Company "ANN," Namuroise, Belgium

Depot for Archery, Cricket & Base Ball Implements.

And C. A. KLEEMANN'S CELEBRATED GERMAN STUDY LAMPS.

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JEWELRY CASE MANUFACTURERS.

☞Show Case Trays in Black Walnut and Rosewood.

Velvet Cases for Diamonds a Specialty.

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THE PORPOISE.

☞This Oil is made from the best of stock, is free from gum or corrosion, will stand the coldest weather, and is every way reliable.

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☞KOCH & CO., Elberfield, Prussia, Sole Agents in Europe.

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—AND—

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Sole Agents for H. L. Mathey, Locle, Switzerland.

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Solid Gold Finger Rings of Every Description.



Crown, 18k. Lion.



On and after January 1st, 1876, our make of Filled Plain Rings will be stamped as above, which stamp is copy righted. Any and every infringement on the above Trade Mark will be dealt with according to law. ☞Every one warranted.

THESE GOODS ARE SOLD BY ALL THE LEADING JOBBERS!

Should the house that any retailer deals with not have them we will furnish them with the address of the nearest Jobber. ☞SELL TO THE JOBBING TRADE ONLY!

New York Office, 11 Maiden Lane.

☞Address all communications to Philadelphia.

BERNARD LEVY,

Manufacturer of Watch Cases

—AND—

JOBBER OF AMERICAN MOVEMENTS,

No. 402 Library Street,

PHILADELPHIA.

ALSO, ORNAMENTAL ENGRAVER AND ENGINE TURNER.

Lubricating Oils, for Watch, Clock and Chronometer Makers.

The discovery of a Lubricator for FINE MACHINERY, such as Watches, Clocks and Chronometers, that is free from gum and corrosive substances, has taxed the ingenuity of hundreds of men whose efforts have proved a failure. But we are happy to say (being largely interested) that such an article has been supplied by MR. EZRA KELLEY, of New Bedford, Mass., who, after forty years study of the subject, has perfected a Lubricator that recomends itself to all who have used the *genuine*, (there having been numerous counterfeits in the market,) as witness also the award of a Diploma and Medal by the judges of the late Centennial Exhibition at Philadelphia. We have no besitation in saying that his Oils are the BEST manufactured, always uniform in quality and capable of standing all tests applied to lubricating oils. We cheerfully recommend it to all who may in their business require a FIRST-CLASS LUBRICATOR.







AMERICAN CLOCK CO., (Hine & Thomas.)

P. S.—The above Oils can be procured at all first-class wholesale Watch and Clock Establishments in the United States, as well as his only Agents, GRIMSHAW & BAXTER 35 Goswell Street, London England.

New Bedford, October 15, 1877.

WALTHAM WATCHES

ONE MORE STEP AHEAD.

New Model Waltham Watches.

IMPROVED IN APPEARANCE AND QUALITY, BUT NO HIGHER IN PRICE.

The American Watch Co., of Waltham, Mass., is the only American Watch Company awarded the GOLD MEDAL at the PARIS EXPOSITION.

After an experience of many years in selling watches of all grades, from the best makers, we have found none that have given such satisfaction as the "Waltham," and unhesitatingly recommend WALTHAM WATCHES as superior to all others.

Every WALTHAM WATCH sold by us is accompanied by our own guarantee, in addition to that of the American Watch Company.

CAUTION.

It having been demonstrated by frequent assays that many gold and silver cases offered in the market are greatly debased from the quality they assume to be, purchasers of WALTHAM WATCHES, to avoid imposition, should observe that every genuine watch, whether gold or silver, bears the trade mark of the AMERICAN WATCH CO. on both case and movement.

"Eighteen carat" gold, such as WALTHAM cases are made of, is as nearly pure gold as can be made and be durable. It contains 750-1000 of pure gold, and 250-1000 of alloy.

Sterling Silver (English Government Standard) contains 925-1000 of pure silver, and 75-1000 of alloy.

We keep the most complete assortment of these watches constantly on hand, and are prepared to furnish them at the lowest possible cost.

N. MATSON & CO.,

State and Monroe Sts., Chicago.

(From the N. O. Times, Oct. 16th, 1878.)

AMERICAN WALTHAM WATCH AGENCY

86 St. Charles Street,

Corner Commercial Place, New Orleans.

Watches for Ladies, Gentlemen, Mechanics, Laborers and Boys.

RAILROAD WATCHES A SPECIALTY.

The American Watch Company

Manufacture five different sizes and 32 distinct grades of Key and Stem-Winding Watches, and every watch fully guaranteed. The success of these watches has been remarkable. In 1874, the Company first opened an office in London, England. The first year, only 500 were sold; the second year, 1,800; the third year, 5,000, and last year, 1877, 28,000. These watches are now universally known, and **1,200,000** are speaking for themselves in the pockets of the people. Such is the growth of this Great American Industry. I have sold over **6,000** of these watches in different parts of the South, and as far as I can learn they are all giving satisfaction to-day.

A. M. HILL, Jeweler.

WALTHAM WATCHES.

We would state to our patrons and the public:

1.

That after an experience of forty-six years in selling watches of every grade, from all the best English and Swiss makers, we have never found any to give such perfect satisfaction as the "WALTHAM." BAILEY, BANKS & BIDDLE.

2.

That for accurate time-keeping, durability, and reliability the "WALTHAM" is unequalled.

BAILEY, BANKS & BIDDLE.

3.

Every "WALTHAM" we sell is accompanied by our own guarantee, in addition to that of the American Watch Company.

BAILEY, BANKS & BIDDLE.

4.

We are the leading house in Philadelphia for the sale of these watches. We keep on hand a complete assortment of every grade and variety. As we buy for cash, we can sell at the lowest possible figures.

Bailey, Banks & Biddle,

(Late BAILEY & Co.,)

Cor. of 12th and Chestnut Sts., Philadelphia.

AMERICAN

Waltham Watches!

ENDORSED BY THE LEADING JEWELERS EVERYWHERE.

Theodore B. Starr,

(Of the late firm of STARR & MARCUS.)

No. 206 Fifth Ave., bet. 25th & 26th Sts.

Extending through to No. 1126 Broadway.

By special arrangement with the AMERICAN WATCH COMPANY, *of Waltham, Mass., has opened a Department for the sale of* Watches *of their manufacture, conducted upon such a scale as will present at all times, for the examination of purchasers, a fuller and more representative stock than has been hitherto accessible to the general public.*

M. S. SMITH & CO.

Jewelers,

Watchmakers and Diamond Importers,

COR. WOODWARD & JEFFERSON AVES.,

DETROIT, Mich.

These Watches commend themselves to all desiring a reliable time-keeper, the Waltham Company having spent years in bringing their Watches to their present high standard; and we do not hesitate to say that they are the best Watches, for the money they cost, that are manufactured

WALTHAM

WATCHES

During a quarter of a century we have been celebrated for selling the finest Watches that are made in the world, and we have never sold any other.

Having had abundant opportunity during a series of years to thoroughly test the merits of these watches, we are prepared to offer them under our own guarantee and to fully indorse their claims for accuracy and reliability.

The marked success which they have commanded in Europe, notably at the Paris Exposition, as well as at our own Centennial, where they have been subjected to competition with the production of the best foreign makers, is a most encouraging and gratifying evidence of the increasing superiority of American manufactures.

We have a full line of all the most desirable movements in stock, and will take pleasure in giving every information that may be desired.

Close prices marked in plain figures.

J. E. CALDWELL & CO.,

No. 902 Chestnut St, Philadelphia.

WALTHAM WATCHES.

One More Step Ahead.

NEW MODEL WALTHAM WATCHES.

Improved in Appearance and Quality, but no Higher in Price.

The American Watch Co., of Waltham, Mass., is the only American Watch Company awarded the GOLD MEDAL at the PARIS EXPOSITION.

After an experience of many years in selling watches of all grades, from the best makers, we have found none that have given such perfect satisfaction as the "Waltham," and unhesitatingly recommend WALTHAM WATCHES as superior to all others.

Every WALTHAM WATCH sold by us is accompanied by our own guarantee, in addition to that of the American Watch Co.

CAUTION.

It having been demonstrated by frequent assays that many gold and silver cases offered in the market are greatly debased from the quality they assume to be, purchasers of WALTHAM WATCHES, to avoid imposition, should observe that every genuine watch, whether gold or silver, bears the trade-mark of the American Watch Company on both case and movement.

"Eighteen carat" gold, such as WALTHAM cases are made of, is nearly pure gold as can be made and be durable. It contains 750–1000 of pure gold, and 250–1000 of alloy.

Sterling Silver (English Government Standard) contains 925–1000 of pure silver, and 75–1000 of alloy.

We keep the most complete assortment of these watches constantly on hand, and are prepared to furnish them at the lowest possible cost.

Benedict Brothers,

No. 171 Broadway, New York.

MANUFACTURERS OF EXCLUSIVELY

BLACK ONYX GOODS,

WOGLOM & MILLER,
32 & 34 JOHN STREET,
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HENRY FERA,

Importer of Diamonds,

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Having my own cutting and polishing establishment at Nos. 23 and 25 Looijersgracht, Amsterdam, Holland, constantly running 36 mills, I am able to offer to the trade a full assortment of Diamonds at very low prices.

Loose and Mounted Goods sent on approval to any part of the country on receipt of satisfactory references.

ROSKOPF WATCH.

J. D. HUGUENIN & CO.,
GENERAL AGENTS,
No. 12 Maiden Lane, New York.

The reputation of this Watch as an accurate timekeeper is fully established, and during the ten years that it has been before the Trade, has won an abiding reputation for fine Time-keeping qualities, and the BEST WATCH for the money in the world.

☞Send business card for price list.

HAMILTONS & HUNT,

MANUFACTURERS OF

Fine Plated Chains

AND PATENT BUCKLE BRACELETS,

Branch Office, 176 Broadway, New York

FACTORY, 226 EDDY STREET, PROVIDENCE, R. I.

BOOZ & THOMAS,

MANUFACTURERS OF

TRADE MARK

Watch Cases & Jewelry,

108 SOUTH EIGHTH STREET,

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Illustrated Catalogues sent upon application.

Old Gold & Silver Bought or Exchanged.

PARTICULAR ATTENTION PAID TO REPAIRING.

JULIEN GALLET,

Importer of Watches,

From his own Factory, Chaux de Fonds, Switzerland.

No. 25 JOHN STREET,

Leon L. Gallet,
Charles Perret,
Jules Racine.

NEW YORK.

E. A. HALDIMANN,

IMPORTER OF

Watches, Watch Materials,

AND OPTICAL GOODS;

Also DEALER IN JEWELRY,

No. 66 Nassau Street, New York.

Country orders solicited. Watch repairing and jewelry jobbing done on the premises, in the best manner, and at reasonable prices.

☞All orders promptly attended to.

MILNE & JOURDAIN,

Manufacturers of Stem-Winding Watch Crowns



13 & 15 Franklin Street, NEWARK, N. J.

Gold Crowns, for Stem-winding Movements, to suit all sizes of Imported or American Watches, in four different styles and seven sizes.

Gold Pushers for Key Movements in every size. Also Gold Crowns for fine Chronograph Watches made to order.

☞Silver Stem winding Crowns and Key Pushers on hand or made to order. Send for card and samples.

A. MILNE. A. JOURDAIN.

L. & A. MATHEY,

IMPORTERS OF FINE WATCHES AND MOVEMENTS



No. 16 Maiden Lane, New York.

Independent ¼ Seconds, Minute Repeaters, Minute Chronographs, Plain Chronographs, Double Chronographs, Independent Split Seconds, Perpetual Calendars, Pocket Chronometers.

MINUTE CHRONOGRAPHS, WITH MINUTE REPEATER.
CHRONOGRAPHS, WITH MINUTE REPEATER.
AND A FULL LINE OF MEDIUM GRADE WATCHES AND MOVEMENTS.

Sole Agents for the H. L. MATILE WATCHES.

☞Timing and Complicated Watches a specialty. All our Watches are tried and tested before delivery. ☞Goods sent for examination on satisfactory references.

An attractive line of Chattelaines and Chattelaine Watches.



Established 1828.

JACOB BENNETT & SON,

Diamond Setters and Manufacturing Jewelers,

No. 108 SOUTH EIGHTH STREET, PHILADELPHIA.

WE MANUFACTURE AND MAKE A SPECIALTY OF
EVERY DESCRIPTION OF
DIAMOND MOUNTINGS
SUPERIOR IN DESIGN AND WORKMANSHIP.



MASONIC MARKS,
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SOCIETY AND POLICE BADGES MADE TO ORDER.
FINE WHOLE PEARL JEWELRY.

GOODS SENT ON MEMORANDUM TO ANY PART OF THE UNITED STATES.

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Makers and Importers of SWISS WATCHES,

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Watch Tools, Materials, Glasses, &c.
No. 21 Maiden Lane, New York.

The CENTENNIAL WATCH (Stem-Winding and Stem-Setting) so universally popular, has achieved a standard reputation, and is generally conceded to be the best made watch for the money in this market. Being the sole manufacturers of this celebrated Timekeeper, we are enabled to give it our strongest endorsement. Especial attention is called to the "HENRY BEGUELIN," "DROZ & PERRET," and other well known Swiss Watches, as well as to our full and complete line of all grades of American Watches, on which we give the full trade discount.

☞The attention of Watchmakers is directed to our new DRILLS, in sets of 21 sizes. The most complete and serviceable drill ever offered.

None Genuine without this TradeMark



The above is a fac-simile of the Centennial Watch.

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Finest Quality of Electro-Plated Flat Table Ware.

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UNSURPASSED IN QUALITY, STYLE AND FINISH!

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Spoons, Forks, Ladles, Fancy Pieces,

Solid Handle Steel Knives, &c., of the finest quality.

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Works at Waterbury, Conn.



AMERICAN PEDOMETER.

Messrs. TIFFANY & CO. invite public attention to the AMERICAN PEDOMETER, a remarkable invention of Mr. Benjamin S. Church, the well known Engineer of the Croton Aqueduct.

This instrument accurately measures the distance a person carrying it walks, showing the amount of daily exercise taken in and out of doors.

Its mechanism is a marvel of simplicity, and can be adjusted to any length of step. It is strong and durable, and the size of a small watch. Ladies, Professional and Business Men, Students, Pedestrians, Sportsmen, Farmers, Surveyors, and others will find it very useful. A table accompanies each Pedometer, giving the number of steps taken in a mile, second, minute, hour and day. Retail Price, $5.00.

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THE TRADE SUPPLIED AT WHOLESALE ONLY BY **TIFFANY & CO., 14 John Street, New York.**

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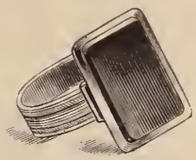

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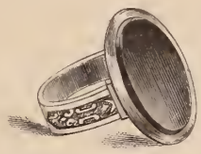

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Orders solicited for goods on approval.

Stone Seal Engraving and Jobbing of every description promptly and carefully done.

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No. 81 CHAMBERS STREET, NEW YORK.

Manufacture CHEMICALLY PURE COPPER for ALLOYING, and are prepared to fill orders for same, either in the Wire, Strip or Granulated form. Its PURITY has been attested as follows.

UNITED STATES ASSAY OFFICE, 30 WALL STREET,
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BROWN & BROS.

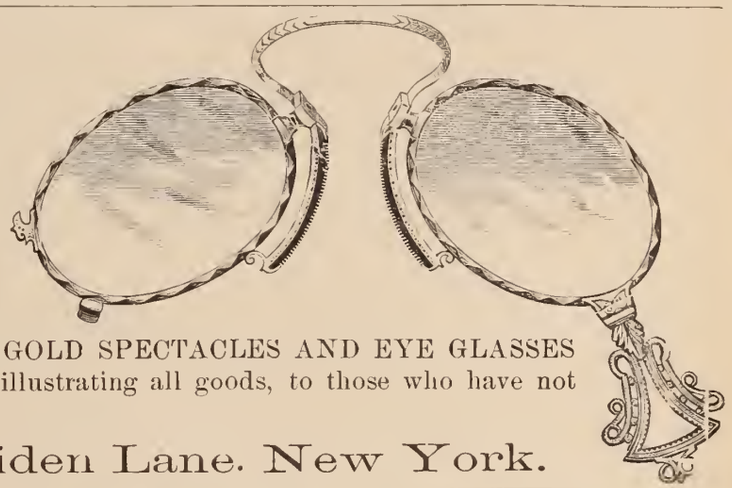
Dear Sir.—We have analyzed the two samples of Copper left with us on the 18th instant, one said to be foreign refined Copper as used by jewelers, the other a refined Copper as manufactured by you for the same purpose. We find both samples alike in purity, and no difference can be detected by a careful chemical analysis, both being samples of PURE METALLIC COPPER, having no traces of antimony, tin, arsenic, zinc or lead.

TORREY & EATON.

SPENCER OPTICAL MANUF'G CO.

MANUFACTURERS OF GOLD

Spectacles AND Eye Glasses



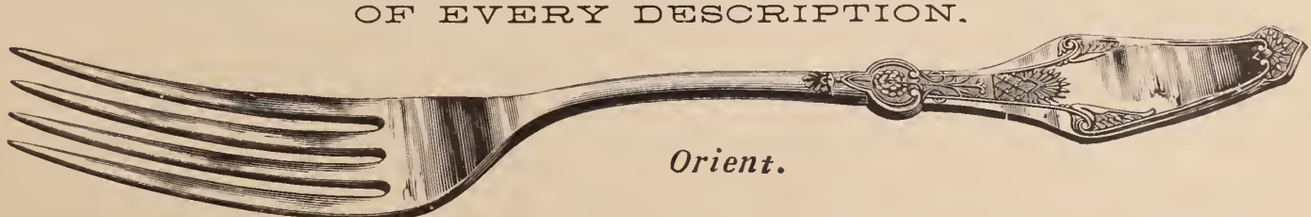
☞ Special attention is called to our large assortment of GOLD SPECTACLES AND EYE GLASSES for the HOLIDAY TRADE. Will send our Catalogue, fully illustrating all goods, to those who have not received it, on application.

FACTORIES, MT. KISKO, N. Y. Office, 13 Maiden Lane. New York.

REED & BARTON,

Manufacturers of Fine Silver-Plated Table Ware

OF EVERY DESCRIPTION.



Orient.

☞ Would call attention of the trade to their new design of fork (illustrated above) which we believe to be the finest design ever manufactured in plate. We are also manufacturing a great number of new designs in all kinds of hollow-ware, and among other things a great number of Fancy Pieces, such as Jewel Boxes, Card Stands, and Case Cologne Sets, etc., which are specially adapted to the holiday trade

Factories, Taunton, Mass. **No. 686 BROADWAY, NEW YORK.**

ESTABLISHED 186 9.

The Jewelers' Circular and Horological Review.

THE RECOGNIZED ORGAN OF THE TRADE, AND THE OFFICIAL REPRESENTATIVE OF THE JEWELERS' LEAGUE.

TENTH VOLUME.

THE TENTH VOLUME will begin with the February, 1879, number and will contain a fund of practical information that will render it invaluable to dealers and all persons interested in the Watch, Clock, Jewelry and kindred industries.

To the practical workman the JEWELERS' CIRCULAR is invaluable as a text-book and work of reference. Its pages furnish him with the latest scientific and mechanical ideas, set forth in plain, comprehensible language by specialists of ability and experience. The technical information contained in its columns represents the progress of the age, and every intelligent workman in the country acknowledges the advantages resulting from a study of its pages.

To the country dealer the JEWELERS' CIRCULAR affords thorough, correct and perfect information as to staple and original articles of trade. From it he can learn what to order and where to obtain supplies, he can discover the best source of materials in common use, while the latest novelties are without exception first announced in its columns.

To the leading manufacturers and jobbers the JEWELERS' CIRCULAR has proved to be THE BEST ADVERTISING MEDIUM FOR THE TRADE. Its readers comprise the customers of those houses, and consequently the business announcements are carefully studied, and liberally responded to. Hence an extensive and increasing patronage has been accorded to the JEWELERS CIRCULAR by the leading manufacturers and jobbers, which speaks for itself and needs no further comment.

The JEWELERS' CIRCULAR has acquired an enviable reputation, by its undeviating advocacy of the highest standard of commercial integrity, and its persistent opposition to those who dishonor and demoralize business by compromise and fraud. It has always been ready to promulgate and further plans and enterprises tending to the public good, and its columns have always been open to the honest expression of private opinion concerning matters which needed to be mended. Its information on commercial matters, much of which is nowhere else to be obtained, is of great importance and benefit, while the completeness of its directory and business columns render it indispensable to those concerned in the trade.

The JEWELERS' CIRCULAR is an art journal worthy of the artistic interest and industries which it represents. The technical articles are illustrated by carefully executed diagrams, and during the past year new designs and trade novelties have been presented, in ten splendid plates, printed in gold, silver and colors. Its elegant and tasteful typography is apparent in its advertising pages, where every announcement is rendered attractive and conspicuous.

The JEWELERS' CIRCULAR is a welcome visitor and powerful influence in the workshop, in the store and in the counting room. The best testimony to its merits is to be found in the indorsement accorded to it by the trade at large. Every one who has goods to sell finds that IT PAYS TO ADVERTISE in the JEWELERS' CIRCULAR, because all who buy goods seek and find their information in its pages, while every dealer and workman finds that IT PAYS TO SUBSCRIBE, because they obtain a return in intelligence and instruction of infinitely greater pecuniary value. In the future, as in the past, no expense or care will be spared to improve the JEWELERS' CIRCULAR, and render it attractive, beneficial, instructive and indispensable; while it is hoped that the continuance of the subscription price at $2 per annum (a rate far beneath that of any monthly publication of its size and contents), will obtain for it the widest possible circulation both at home and abroad.

All communications to be addressed to D. H. HOPKINSON, 42 Nassau Street, N. Y.

NOW IS THE TIME TO SUBSCRIBE.

TIFFANY WATCHES.

FOR LADIES AND GENTLEMEN.

SIMPLE!

STRONG!

DURABLE!

ACCURATE!

RELIABLE!



ADJUSTED TO

TEMPERATURE and

POSITIONS, and

CASED IN

18 *Karat GOLD.*

EACH and every movement finished under our own supervision by thoroughly skilled hand labor, and guaranteed to be "as fine time keepers to carry as are made!"

Every genuine TIFFANY WATCH has engraved upon the movement the firm name "TIFFANY & Co." and none others are made by our workmen!

More "value received" than ever before known in the watch business! Exclusive sale given under special contracts, and circulars for distribution sent gratis!

AGENTS protected and goods sent "on memorandum" for examination or selection upon receipt of satisfactory references! We do not sell Jobbers!

Refinishing, stoning, raying and engraving nickel movements done on the premises! Engraving inscriptions, devices and monograms on cases promptly attended to!

The TIFFANY WATCHES are retailed at less than the importation cost of many so-called fine watches!

☞ Dealers must sell them at our established retail price!

TIFFANY & Cº

NEW YORK, PARIS, LONDON, GENEVA.

MAKERS OF FINE AND COMPLICATED WATCHES,

Wholesale Office, 14 John Street, New York.

GEO. R. COLLIS, Manager.

☞ General Agents for **Messrs. Patek, Philippe & Co.'s Watches.**

☞ Sole Agents for the **American Pedometer,** the most popular and salable article known to the trade. Retail price, $5.00.

C. G. ALFORD & CO.,

Manufacturing Jewelers,

No. 183 BROADWAY, NEW YORK.

TO THE TRADE.

Our efforts to protect the interests of the **legitimate Jewelry Trade** *by refusing to send our Illustrated Catalogue to* **outside** *dealers has won the universal approval of the entire* **retail trade,** *who have demonstrated their appreciation of our efforts in this direction, by sending us their orders. We are glad to know that our Catalogue occupies an important place in the stores of* **Retail Jewelers,** *and that they in many ways find it of great convenience.*

We have in contemplation certain changes that will add to its interest and usefulness, which will be made known when they assume a definite form.

We wish to state that we shall in the future, as in the past, use our best efforts to protect the interest of patrons, the **legitimate retail dealers,** *by publishing a Catalogue exclusively for their use, and one that may be shown to their customers without the risk of exposing their profits.*

☞ **Applicants for copies must enclose business card** *as a guarantee that they are regularly in the trade.*

L. HAMMEL & CO.,

Importers of Watch Materials, Tools



We would respectfully call your attention to our new design of an improved Spectacle Case which will doubtless commend itself to your favorable consideration. The improvement, consisting in the joint being on the top of the case, making it stronger and more durable than the old style of case, and the cut away for the insertion of the Spectacles renders it the most practical case made. These goods are made in all grades of leather and for all styles of spectacles, in price from $6 to $13.50 a gross, and stamped to order with name and address of the purchaser, at $2 per gross extra.

Samples sent by mail on receipt of 10 cents on application to

Opera Glasses and Optical Goods of Every Description

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☞ We would respectfully call the attention of the Trade to the celebrated **Star Spectacles and Eye Glasses,** of which we are the Sole Importers.

No. 9 Maiden Lane, New York.

☞ Sole Agents in the United States for **G. B. Wheeler's Star Watch and Clock Oil,** and the Celebrated **Gravier Mainspring.**

LEO HAMMEL. LOUIS RUNKEL.

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Fine Hair Jewelry

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Pattern books constantly on hand, and will be sent upon receiving satisfactory references.
Patterns from any other books can be ordered from me by giving number of design and name of book.

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Sole Agent for Comins' Improved Amalgamator

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HENRY LEFORT,

Stem-Winding Watch Crown Manufacturer,

Crowns and Pushers in gold, all sizes, quality and color, made to order. Silver crowns and pushers always on hand.
☞ Samples sent on application.

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☞ Designs made and estimates given on all kinds of Engraving for Jewelers.

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ENGRAVERS ON WOOD
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☞ Illustrations for Books, Mf'g Catalogues, &c.
☞ Labels and Show Cards Engraved on Metal for Color Printing.

Solid Gold Rings.

TO THE TRADE

For the past twenty seven years I have made the manufacture of PLAIN GOLD RINGS a Specialty, and have given to every branch of the business my personal attention. I am, therefore, able to sell at the LOWEST CASH PRICES, and in every case guarantee the quality. I will send to any address, with proper reference, from 50 to 500 dwts, net cash, the goods to be returned if not found satisfactory. I also make Children's Rings, Silver Rings and Half-round Chased Rings. For uniformity, and the convenience of my customers, Allen's U. S. Gauge has been adopted as the standard in my manufactory. Parties desiring Single Rings can have them forwarded upon payment of 25 cents extra. Orders for all other jewelry filled at the Lowest Cash Prices. Old Gold received and refined, and $1.03 in gold allowed per pennyweight. Yours respectfully,

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Particular attention paid to Remounting
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Full line of new and original mountings on hand.

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And DIAMOND SETTER.

Incrusted Goods a specialty.
All kinds of Lapidary Work promptly executed.

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Designs furnished and estimates given.

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No. 4 LIBERTY PLACE, NEW YORK.
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Improved Gold and Silver

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AUTOMATIC EYE GLASS HOLDER,
Which returns the Eye Glasses to their place on or under the lapel of the vest by simply casting them from the nose, combining all the conveniences of Cord, Hook and Case, without their annoyances.

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Rosewood and Black Walnut Trays,

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☞ Rough, Boart, Cabinet Specimens, Roses and Brilliants constantly on hand, and for sale.
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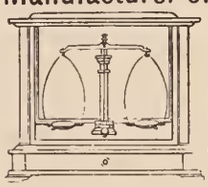
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DIAMOND SCALES,

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Solid Gold Rings

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Viz., Plain, Chased, Engraved, Enameled, Engine Turned, Shield & Scale. *All qualities Warranted*
Orders Promptly Executed.

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Combination Whitby Jet and Vulcanite,
Byron's Patent, May 18, 1869,

Also a full line of Lockets—plain, gold mounted and monogram.

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☞ Agents for the NEW RUBBER WATCH CASES, Fitting all American Movements.

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☞ Repairing of every Description for the Trade.
FINE WATCHES A SPECIALTY.

To the Trade.—I am now prepared to cut all kinds of Stem-Winding Wheels for the Trade.

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and Marine Chronometers,
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Optical Lenses

No. 182 Centre Street, N. Y.

SPECIALTY!

Cylinder and Prismatic Spectacle Glasses, Magic Lantern & Panoramic Lenses.

FINE HAIR WORK

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The only leading personal Artist in Hair in this country.

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Designs of the most complicated description. ☞ Short or Baby Hair made in the finest designs in your presence. Portraits, or copy of noted paintings, made of family hair.

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Lessons given in all branches. Large pattern books for the trade free. Large hair pictures in other books are copyrights from my book and circulated only by my special permit. Prices low on orders from known pattern books.

Gold jewelry and engraving by the best workmen done on the same plan.

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FOR ALL SECRET SOCIETIES.
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Small Experimental Machinery, Models, Small Driving Machinery, &c.

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Fine Lever Movements for Safe Locks a Specialty.

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Solid Gold Mountings for Hair Jewelry, kept constantly on hand, and made to order at shortest notice.
Orders from the country trade promptly attended to.

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Sole Makers of the Separable Sleeve and Collar Buttons in Gold.

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Real and Imitation Stones,

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The tool is made of Steel throughout, with the jaws and wearing parts hardened. Every part is made to guage. The finish is first-class and nickel-plated. Warranted to outwear at least three of the imported pin vises.

Offered in two sizes at $18 and $15 per dozen with liberal trade discount. Sold by the jobbing trade generally or by the

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A Solution for preserving and protecting the polish and color of gold and silver while under process of hard soldering.

The most delicate engraving and chasing is perfectly preserved from tarnishing when treated with this solution, and the article on which it is placed may be heated to a red heat without fear of discoloration. Price, 50 Cents per Bottle.

Sent by Mail, postpaid, on receipt of price.

☞ FOR SALE BY DEALERS IN WATCH MATERIALS.

This Solution is not intended to preserve acid color, but will, in a great measure protect it.

RICHARD OLIVER, 11 John Street, N. Y.

Established 1848. *Reliable and prompt.*

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Wholesale Jewelers,

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Manufacturers & Jobbers in General Jewelry.
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We beg to call the attention of the trade to the above cuts, representing MISSIMER'S PATENT for the REPLACING of SLEEVE Buttons. It is not separable, but works on a simple slide. Recommends itself at sight. Send for sample. A liberal discount to jobbers.

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All Kinds of  WATCHES Made To Order

NO. 20 MAIDEN LANE, N. Y.

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Watches, Jewelry, Clocks, &c.

Low Prices—First-class Stock.

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WHOLESALE ONLY.



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Light Machinery and Tools Made to Order.

Also Chasing, Modeling, Designing, and Fine Brass Finishing. Particular attention given to Making and Repairing Electrical Instruments of all kinds.

Hinges, Corners, Locks and all fancy work for Jewelry Case makers. In workmanship and charges we Defy Competition. Orders by mail will receive immediate attention.

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ABBOTT'S PATENT

XII o'clock Stem-winders

☞Are not made with a "Loose Pinion" to carry the second-hand; but are the regular "full plate" movements, made by the several Watch Companies, with a peculiar device so attached as to bring the stem opposite the figure XII, instead of the figure III.

☞Messrs. J. T. Scott & Co., No. 11 Maiden Lane, are the sole agents for these watches

HENRY ABBOTT,

Patentee and Manufacturer,

Office, 11 Maiden Lane,

NEW YORK.

Factory, 13 & 15 Franklin Sts., Newark, N. J.

☞Stem-Winding Wheels cut to order.

Established 1850.

Trade  Mark.

PETER L. KRIDER,

MANUFACTURER OF

STERLING

SILVER WARE,

Medal and Diploma Awarded, &c.

Striking Society Medals in Gold, Silver or Bronze

A SPECIALTY!

ARTISAN HALL,

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Manufacturer of

Watch Cases

—AND—

Jewelry.

☞Prompt and careful attention given to filling orders for all kinds of goods pertaining to the Trade. Goods sent on approval when satisfactory references are furnished.

☞Designs and estimates given, and special attention paid to orders from jewelers for Watches, Badges, &c., designed for presentation.

☞Every description of Watches and Jewelry carefully repaired for the Trade.

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(Successor to Albert Landsberg.)



IMPORTER AND MANUFACTURER OF

Optical Goods,

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Near Nassau Street, NEW YORK

Sole Agent for

BLACK'S PATENT

Interchangeable Spectacles,

AND

EYE GLASSES.

Jewelers and others who keep spectacles for sale will please observe that, with these PATENT SPECTACLES, it is only NECESSARY to have a full *Complete Assortment of Lenses and Pebbles*, which being all of a UNIFORM SIZE, will FIT either the Gold, Silver, or Steel Frames, of which but a few of each kind are wanted; an advantage which will give a complete assortment of the finest Spectacles, for one-sixth the capital invested in a like assortment of the same quality goods of the old style frames.

For Particulars, price lists, &c., address

GEO. W. DU BOIS,

New York.

Journal Suisse d'Horlogerie,

A MONTHLY TRADE JOURNAL.

Published in Geneva, under the auspices of the Industrial and Commercial Departments of the Societe des Arts.

Devoted to the interests and for the advancement of Watchmakers and the art of Horology.

This periodical is under the supervision of a body of watchmakers, who have correspondents in the kindred branches of industry and sciences, who contribute the leading articles of interesting subjects and illustrations, publishes the reports of the different commercial and industrial societies, of which it is the organ, and is, owing to its great circulation all over the world, a valuable advertising organ.

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Illustrirte Fachzeitschrift fur Uhrmacher.

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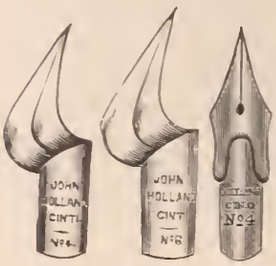
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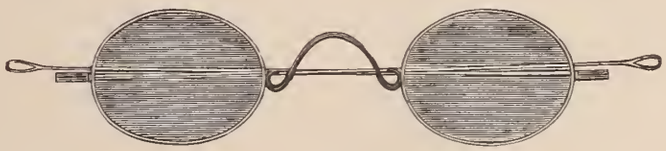
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Kroll, H.—Manufacturer of Fine Jewelry. Repairing (a specialty) done for the trade at moderate prices, 78 Nassau street.

Kuhn & Doerflinger—Manufacturers of Enamel'd and Roman Band Bracelets, also Fine Lockets and Pendants, 18John street.

Lennon, John D.—Manufacturing Jeweler, 142 Fulton street. Flat, and Half-round Gold Bracelets, Roman and Stone Lockets.

Moore & Horton.—11 Maiden Lane, Manufacturing Jewelers, Rings, Studs, Collar and Sleeve Buttons, Pins, Ear-rings, &c.

Mitchell, Noah.—Manufacturer of Fine Gold Jewelry, 694 and 696 Broadway, N. Y.

Miller Bros.—Manufacturers of Fine Jewelry Lockets, Sleeve Buttons, Studs, etc., etc. 11 Maiden Lane, New York.

Mulford & Bonnet—Manufacturing Jewelers and Jobbers, 21 & 23 Maiden Lane, N. Y. Particular attention given to Jobbing and Special orders.

Maass, Cook & Groeschel—Manufacturers of Fine Jewelry and Lockets, 191 Broadway, (over Mercantile Bank,) N. Y.

Marx Kossuth & Co.—Manufacturing Jewelers. 39 Maiden Lane.

Owen, G. & S. & Co.—Manufacturing Jewelers. Office, No. 5 Maiden Lane.

Pendrill, Wm.— Manufacturer of Fine Jewelry, jobbing and repairing for the trade at low rates, 73 Nassau Street.

Riker, William—Manufacturer of Jewelry. Inlaid Gold Jewelry a Specialty. No. 5 Maiden Lane, N. Y.

Riley, J. A. & Co.—Manufacturing Jewelers, Etruscan Gold and Coral Sets, Roman Bracelets, Necklaces, etc. Onyx Goods a specialty. 7 and 9 Bond street, New York.

Richardson, Enos & Co.—Manufacturers of Fine Gold Jewelry, Gold Chains, Lockets, Crosses and Necklaces. Colored and Etruscan Work. No. 23 Maiden Lane, New York.

Richardson, J. W. & Co,—Manufacturers of Jewelry, Masonic and other emblems. 196 Broadway, Manufactory, Providence, R.I.

Sexton & Cole—Manufacturing Jewelers, Colored Gold and Onyx Goods a Specialty. No. 30 Maiden Lane.

Shoemaker & Co.—Manufacturing Jewelers, Cameo Buttons, and Lockets, Roman Gold Goods, etc. No. 21 Maiden Lane, N. Y.

Stites, E.—Manufacturer of Fine Jewelry. No. 12 Maiden Lane, N. Y.

Sturdy Bros. & Co.—Manufacturers of Jewelry, No. 14 Maiden Lane, New York.

Thoma, Ernest—Manufacturer of Fine Jewelry. Sleeve Buttons, Rings, Ear-rings, &c. No. 173 Broadway, N. Y. Factory, Hackensack, N. J.

Trier Bros. & Co.—Jewelry. Optical, Rubber, Jet, Shell, Ivory, Amber and Pearl Goods. Silk Guards, Japanese Bamboo Watch Chains a Specialty. No. 15 Maiden Lane.

Vulcanite Jewelry Co.—Manufacturers of Whitby Jet and Vulcanite Jewelry, 191 Broadway, N. Y.

Wadsworth, E. E.,—Manufacturer of Rich Jewelry and fine Rolled Plate. Fine Seal Rings a specialty. 35 Maiden Lane.

Wheeler, Parsons & Hays.—Manufacturers of Fine Jewelry, Watch Cases, Gold Chains, &c and Dealer in American and Swiss Watches, No. 2 Maiden Lane, N. Y.

Wienhold, Joseph—Manufacturer of Fine Jewelry and Diamond Setter. 24 John St.

Woglom & Miller—Manufacturing Jewelers, Nos. 32 & 34 John street, N. Y. Specialty, Black Onyx goods.

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Brown, Edwin — Lapidary. Manufacturer of Glasses, for all kinds of Jewelry, Clocks, Chronometers, &c. Glasses bent to any shape. No. 85 Nassau st.

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Dennison Mfg. Co.—Manufacturers of Jewelers Findings, Paper Boxes, Cards, Tags, Cottons, Tissue Papers, &c., 198 Broadway, N. Y.

Dahlem, W.—Manufacturer of Cases for Jewelry and Silverware, No. 85 Nassau Street, N. Y Show Case Trays, &c., at the shortest notice

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Kordmann & Michel—Lapidaries, dealers in Precious Stones. Rubies, Sapphires and Peridots cut. No. 32 Maiden Lane.

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Paillard, M. J. & Co—Importers & Manufacturers of Musical Boxes, No. 680 Broadway, N. Y.

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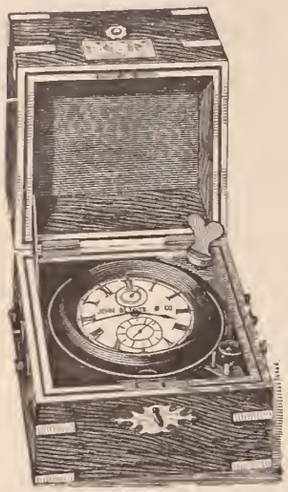
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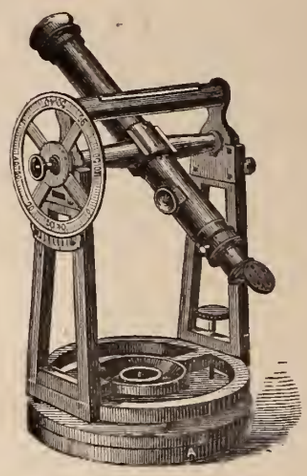
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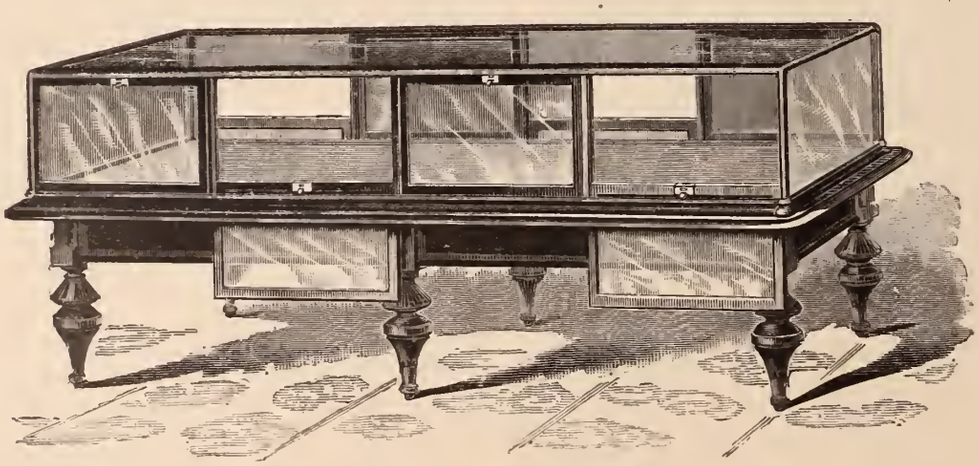
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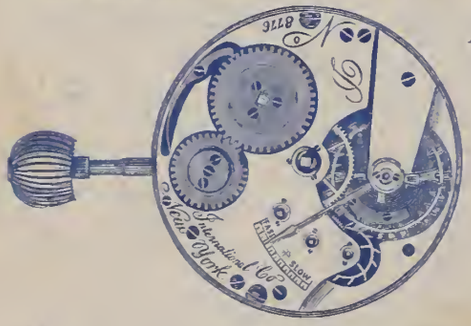
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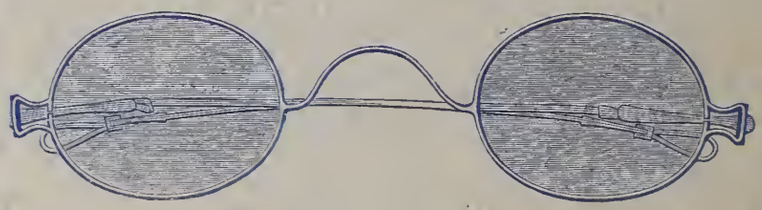
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